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# Washington Water Supply Outlook Report April 1, 2002

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## Washington SNOTEL Sites



# Water Supply Outlook Reports and Federal - State – Private Cooperative Snow Surveys

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## *How forecasts are made*

Most of the annual streamflow in the western United States originates as snowfall that has accumulated in the mountains during the winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Measurements of snow water equivalent at selected manual snow courses and automated SNOTEL sites, along with precipitation, antecedent streamflow, and indices of the El Niño / Southern Oscillation are used in computerized statistical and simulation models to prepare runoff forecasts. These forecasts are coordinated between hydrologists in the Natural Resources Conservation Service and the National Weather Service. Unless otherwise specified, all forecasts are for flows that would occur naturally without any upstream influences.

Forecasts of any kind, of course, are not perfect. Streamflow forecast uncertainty arises from three primary sources: (1) uncertain knowledge of future weather conditions, (2) uncertainty in the forecasting procedure, and (3) errors in the data. The forecast, therefore, must be interpreted not as a single value but rather as a range of values with specific probabilities of occurrence. The middle of the range is expressed by the 50% exceedance probability forecast, for which there is a 50% chance that the actual flow will be above, and a 50% chance that the actual flow will be below, this value. To describe the expected range around this 50% value, four other forecasts are provided, two smaller values (90% and 70% exceedance probability) and two larger values (30%, and 10% exceedance probability). For example, there is a 90% chance that the actual flow will be more than the 90% exceedance probability forecast. The others can be interpreted similarly.

The wider the spread among these values, the more uncertain the forecast. As the season progresses, forecasts become more accurate, primarily because a greater portion of the future weather conditions become known; this is reflected by a narrowing of the range around the 50% exceedance probability forecast. Users should take this uncertainty into consideration when making operational decisions by selecting forecasts corresponding to the level of risk they are willing to assume about the amount of water to be expected. If users anticipate receiving a lesser supply of water, or if they wish to increase their chances of having an adequate supply of water for their operations, they may want to base their decisions on the 90% or 70% exceedance probability forecasts, or something in between. On the other hand, if users are concerned about receiving too much water (for example, threat of flooding), they may want to base their decisions on the 30% or 10% exceedance probability forecasts, or something in between. Regardless of the forecast value users choose for operations, they should be prepared to deal with either more or less water. (Users should remember that even if the 90% exceedance probability forecast is used, there is still a 10% chance of receiving less than this amount.) By using the exceedance probability information, users can easily determine the chances of receiving more or less water.

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# Washington Water Supply Outlook

April 2002

## General Outlook

The first day of spring was supposed to be March 20<sup>th</sup>; however, Mother Nature seemed to play another trick on the Pacific Northwest by providing a widespread blanket of fresh snow. Accumulations of a foot or more were reported at many of the SNOTEL sites located in the Cascade Mountains. This sudden and unexpected increase in precipitation certainly helped boost annual accumulations. Above average precipitation came mostly in the form of snow with average monthly temperatures being 3-6 degrees below normal. Forecasters indicate a shift to seasonal temperatures and precipitation for the next month.

## Snowpack

The April 1 statewide SNOTEL readings were above average at 127%. The Entiat River Basin snow surveys reported the lowest readings at 86% of average. Readings in the Tolt River Basin reported the highest at 195% of average. Westside averages from SNOTEL and April 1 snow surveys included the North Puget Sound river basins with 134% of average, the Central Puget river basins with 169% and the Lewis-Cowlitz basins with 136% of average. Snowpack along the east slopes of the Cascade Mountains included the Yakima area with 116% and the Wenatchee area with 100%. Snowpack in the Spokane River Basin was at 144% and the Walla Walla River Basin had 126% of average. Maximum snow water content in Washington was at Paradise Park SNOTEL near Mount Rainer, with water content of 84.5 inches. This site normally has 71.9 inches of water content on April 1. The highest average in the state was Spirit Lake SNOTEL in the Cowlitz River Basin with 411% of average.

BASIN	PERCENT OF LAST YEAR	PERCENT OF AVERAGE
Spokane .....	257	141
Newman Lake .....	316	147
Pend Oreille .....	171	102
Okanogan .....	185	111
Methow .....	210	104
Similkameen .....	158	104
Wenatchee .....	193	109
Chelan .....	223	120
Upper Yakima .....	200	121
Lower Yakima .....	216	111
Ahtanum Creek .....	216	115
Walla Walla .....	207	126
Lower Snake .....	188	113
Cowlitz .....	206	109
Lewis .....	247	162
White .....	214	108
Green .....	255	154
Puyallup .....	218	108
Cedar .....	237	169
Snoqualmie .....	240	159
Skykomish .....	237	151
Skagit .....	259	127
Baker .....	266	134
Nooksack .....	234	140
Olympic Peninsula .....	263	120

## Precipitation

During the month of March, the National Weather Service and Natural Resources Conservation Service climate stations reported mostly near to above average precipitation totals throughout Washington river basins. The highest percent of average in the state was at Stampede Pass, which reported 282% of average for a total of 20.7 inches. The average for this site is 7.35 inches for March. Basin averages for the water year remain near to above average with the Spokane area reporting the highest at 124% and the Walla Walla River Basin with the lowest at 102% of average.

RIVER BASIN	MARCH PERCENT OF AVERAGE	WATER YEAR PERCENT OF AVERAGE
Spokane .....	156	124
Colville-Pend Oreille .....	116	119
Okanogan-Methow .....	119	108
Wenatchee-Chelan .....	155	111
Upper Yakima .....	151	111
Lower Yakima .....	115	108
Walla Walla .....	96	102
Lower Snake .....	134	112
Cowlitz-Lewis .....	119	110
White-Green-Puyallup .....	124	104
Central Puget Sound .....	152	115
North Puget Sound .....	114	117
Olympic Peninsula .....	92	119

## Reservoir

Seasonal reservoir levels in Washington vary greatly due to specific watershed management practices required in preparation for irrigation season, fisheries management, power generation and flood control. Reservoir storage in the Yakima Basin was 409,000-acre feet, 74% of average for the Upper Reaches and 132,000-acre feet, 87% of average for Rimrock and Bumping Lakes. The power generation reservoirs included the following: Coeur d'Alene Lake, 143,000 acre feet, 84% of average and 60% of capacity; Chelan Lake, 187,000 acre feet, 87% of average and 28% of capacity; and the Skagit River reservoirs at 86% of average and 45% of capacity.

BASIN	PERCENT OF CAPACITY	CURRENT STORAGE AS PERCENT OF AVERAGE
Spokane .....	60	84
Colville-Pend Oreille .....	54	117
Okanogan-Methow .....	30	40
Wenatchee-Chelan .....	28	87
Upper Yakima .....	49	74
Lower Yakima .....	57	87
North Puget Sound .....	45	86

## Streamflow

April forecasts vary from 155% of average for the Rex River near Cedar Falls to 88% of average at Chamokane Creek near Long Lake and the Snake River below Lower Granite Dam. April-September forecasts for some western Washington streams include the Cowlitz River at Castle Rock, 101%; Green River, 115%; and Skagit River, 107%. Some eastern Washington streams include the Yakima River near Parker, 114%; Wenatchee River at Plain, 105%; and Spokane River near Post Falls, 133%. Volumetric forecasts are developed using current, historic and average snowpack, precipitation and streamflow data which is collected and coordinated by organizations cooperating with NRCS.

Eastern Washington March streamflows were, for the most part, below average due to cooler than normal temperatures. Western Washington reported near average flows last month. The Walla Walla River near Milton Freewater had the highest reported flows with 127% of average. The Kettle River near Laurier with 46% of average, was the lowest in the state. Other streamflow percent of averages: the Cowlitz, 89%; the Spokane at Spokane, 76%; the Columbia below Rock Island Dam, 70%; and the Cle Elum near Roslyn, 71%.

BASIN	PERCENT OF AVERAGE MOST PROBABLE FORECAST (50 PERCENT CHANCE OF EXCEEDENCE)
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Spokane .....	133
Colville-Pend Oreille .....	88-104
Okanogan-Methow .....	95-107
Wenatchee-Chelan .....	100-109
Upper Yakima .....	108-117
Lower Yakima .....	107-114
Walla Walla .....	99-109
Lower Snake .....	88-112
Cowlitz-Lewis .....	94-116
White-Green-Puyallup .....	109-115
Central Puget Sound .....	117-155
North Puget Sound .....	104-107
Olympic Peninsula .....	104-106

STREAM	PERCENT OF AVERAGE MARCH STREAMFLOWS
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Pend Oreille below Box Canyon .....	67
Kettle at Laurier .....	46
Columbia at Birchbank .....	77
Spokane at Long Lake .....	85
Similkameen at Nighthawk .....	73
Okanogan at Tonasket .....	64
Methow at Pateros .....	75
Chelan at Chelan .....	78
Wenatchee at Pashastin .....	80
Yakima at Cle Elum .....	76
Yakima at Parker .....	68
Naches at Naches .....	65
Grande Ronde at Troy .....	67
Snake below Lower Granite Dam .....	59
SF Walla Walla near Milton Freewater .....	127
Columbia River at The Dalles .....	65
Lewis at Ariel .....	92
Cowlitz below Mayfield Dam .....	89
Skagit at Concrete .....	86

*For more information contact your local Natural Resources Conservation Service office.*



# BASIN SUMMARY OF SNOW COURSE DATA

APRIL 2002

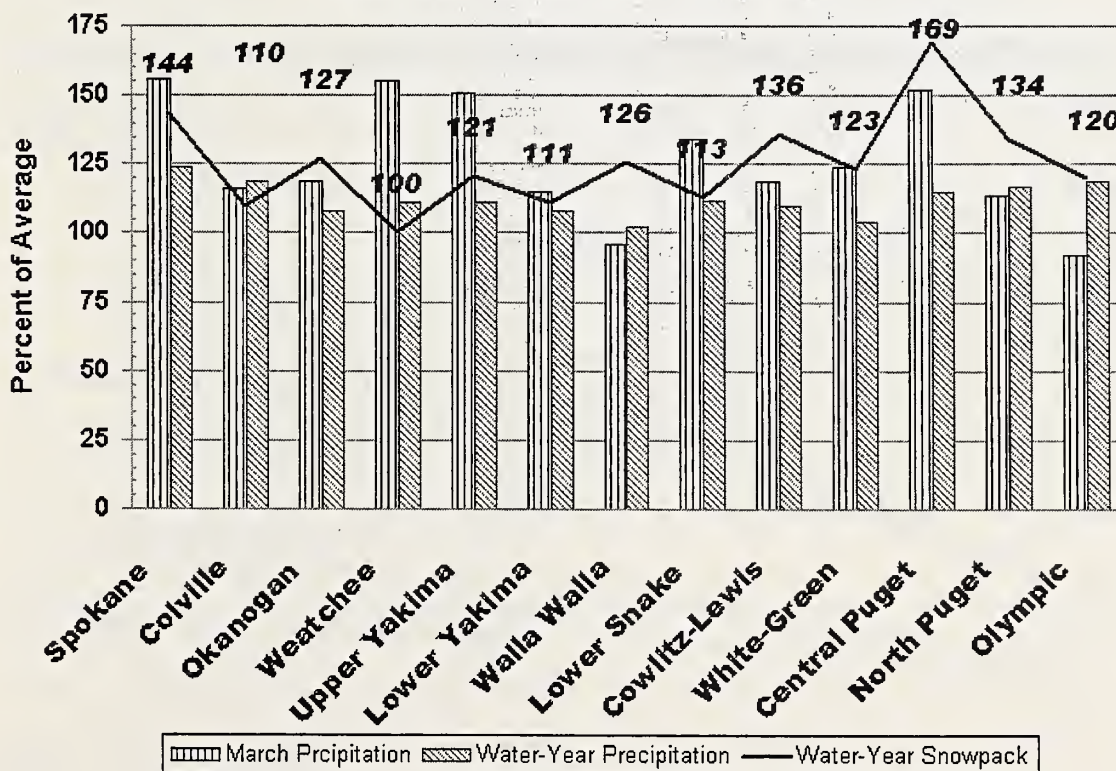
SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1971-00	SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1971-00
ABERDEEN LAKE CAN.	4000	3/26/02	19	4.8	3.5	5.6	GREEN LAKE SNOTEL	6000	4/01/02	74	26.3	12.8	23.0
AHTANUM R.S.	3100	3/28/02	9	3.7	--	5.3	GREYBACK RES CAN.	4700	4/02/02	30	7.6	5.1	9.2
ALPINE MEADOWS	3500	4/01/02	---	78.7E	24.4	42.3	GRIFFIN CR DIVIDE	5150	3/29/02	34	10.6	7.0	10.3
ALPINE MEADOWS SNTL	3500	4/01/02	---	81.0	34.6	43.6	GROUSE CAMP SNOTEL	5380	4/01/02	---	22.6	12.3	19.7
AMBROSE	6480	3/27/02	38	10.5	7.5	12.4	GUNSLIGHT LAKE	6300	4/02/02	122	45.9	24.4	39.3
ASHLEY DIVIDE	4820	3/26/02	29	8.0	3.5	6.0	HAMILTON HILL CAN.	4550	3/28/02	54	15.7	8.9	14.0
BADGER PASS	6900	4/02/02	113	43.4	--	--	HAND CREEK SNOTEL	5030	4/01/02	---	11.2	8.3	11.7
BADGER PASS SNOTEL	6900	4/01/02	---	40.6	18.9	35.3	HARTS PASS SNOTEL	6500	4/01/02	123	47.9	21.5	46.3
BAREE CREEK	5500	3/28/02	120	40.1	23.7	43.1	HEART LAKE TRAIL	4800	3/26/02	77	26.4	11.7	20.6
BAREE MIDWAY	4600	3/28/02	94	31.8	18.5	33.0	HELL ROARING DIVIDE	5770	3/27/02	83	30.2	14.0	29.5
BAREE TRAIL	3800	3/28/02	49	16.3	7.8	7.7	HERRIG JUNCTION	4850	3/28/02	79	30.1	12.0	26.0
BARKER LAKES SNOTEL	8250	4/01/02	---	10.7	11.6	14.6	HIGH RIDGE SNOTEL	4980	4/01/02	---	29.8	13.6	23.1
BARNES CREEK CAN.	5320	4/03/02	55	19.0	11.8	20.4	HOLBROOK	4530	3/30/02	38	11.0	6.1	8.2
BASIN CREEK SNOTEL	7180	4/01/02	---	5.0	6.8	8.7	HOODOO BASIN SNOTEL	6050	5/01/02	---	55.4	21.7	45.3
BASSOO PEAK	5150	3/29/02	41	12.4	8.4	9.7	HUMBOLDT GLCH SNOTEL	4250	4/01/02	---	19.9	8.9	11.2
BEAVER CREEK TRAIL	2200	3/29/02	55	21.1	4.4	11.7	HURRICANE	4500	3/30/02	62	22.2	4.5	19.1
BEAVER PASS	3680	3/29/02	87	34.1	12.7	28.8	INTERGAARD	6450	3/26/02	20	4.8	4.8	7.7
BERNE-MILL CREEK (d)	3170	3/29/02	88	34.7	20.9	28.1	ISINTOK LAKE CAN.	5100	3/28/02	27	6.6	5.1	7.2
BIG CREEK	6750	3/26/02	108	40.0	32.0	43.7	JUNE LAKE SNOTEL	3200	4/01/02	---	67.9	25.3	35.7
BIG WHITE MTN CAN.	5510	4/01/02	60	21.0	13.1	20.0	KELLER RIDGE	3700	3/26/02	17	4.8	2.8	--
BLACK MOUNTAIN	7750	3/27/02	34	9.2	11.3	14.6	KELLOGG PEAK	5560	3/29/02	96	38.0	14.2	29.2
BLACK PINE SNOTEL	7100	4/01/02	---	9.1	8.3	12.5	KISHENEH	3890	3/30/02	34	11.2	4.1	6.8
BLEWETT PASS #2	4270	3/27/02	45	16.8	9.3	14.7	KIT CARSON PASTURE	4950	3/28/02	22	7.4	3.4	8.1
BLEWETT PASS#2SNOTEL	4270	4/01/02	37	12.9	6.5	16.4	KLESILKWA CAN.	3450	4/02/02	50	19.6	3.6	11.5
BLUE LAKE	5900	4/02/02	74	25.6	13.7	23.7	KRAFT CREEK SNOTEL	4750	4/01/02	---	15.5	11.9	14.1
BRENDA MINE CAN.	4450	4/01/02	---	16.5	9.3	12.9	LESTER CREEK	3100	3/30/02	80	35.2	14.6	21.4
BRIEF	1600	3/28/02	0	.0	.0	2.5	LIGHTNING LAKE CAN.	3700	4/02/02	39	13.0	6.9	12.0
BROOKMERE CAN.	3000	3/30/02	27	7.1	5.9	7.9	LOGAN CREEK	4300	3/28/02	28	7.5	5.6	6.7
BROWN TOP AM	6000	3/28/02	206	83.4	29.6	60.8	LOLO PASS SNOTEL	5240	4/01/02	95	34.1	14.9	30.3
BRUSH CREEK TIMBER	5000	3/28/02	33	8.9	5.0	8.1	LONE PINE SNOTEL	3800	4/01/02	---	60.1	22.8	36.4
BULL MOUNTAIN	6600	3/28/02	19	4.5	3.3	5.9	LOOKOUT SNOTEL	5140	4/01/02	---	44.9	18.4	31.8
BUMPING LAKE (NEW)	3400	3/27/02	55	19.6	7.0	17.6	LOST HORSE	5940	3/28/02	78	27.2	13.7	30.7
BUMPING RIDGE SNOTEL	4600	4/01/02	---	37.1	16.7	28.6	LOST HORSE SNOTEL	5000	4/01/02	61	23.4	10.2	18.3
BUNCHGRASS MDWSNOTEL	5000	4/01/02	---	32.7	16.3	30.2	LOST LAKE SNOTEL	6110	4/01/02	---	74.2	26.8	60.0
BUTTE CREEK	4070	4/01/02	22	6.4	5.1	8.3	LOWER SANDS CREEK #2	3120	3/27/02	77	28.6	12.2	18.9
CAMP MISERY	6400	3/28/02	131	51.6	27.8	49.3	LUBRECHT FOREST NO 3	5450	3/29/02	22	5.8	4.5	5.7
CARMI CAN.	4100	4/02/02	16	4.6	3.2	5.6	LUBRECHT FOREST NO 4	4650	3/29/02	9	2.6	1.3	1.3
CAYUSE PASS	5300	4/01/02	---	88.0E	41.4	79.8	LUBPFCHT FOREST NO 6	4040	4/01/02	11	2.4	1.7	1.6
CEDAR GROVE	3760	3/28/02	52	14.2	8.6	11.4	LUBRECHT HYDROPLLOT	4200	3/29/02	19	5.5	1.3	2.9
CHESSMAN RESERVOIR	6200	3/25/02	12	2.4	3.2	3.5	LUBRECHT SNOTEL	4680	4/01/02	---	5.4	1.9	3.6
CHICKEN CREEK	4060	3/28/02	50	16.9	10.0	15.2	LYNN LAKE SNOTEL	5900	4/01/02	---	73.3	34.1	65.4
CHIWAIKUM G.S.	2500	3/29/02	33	10.0	5.2	9.2	LYNN LAKE	4000	3/30/02	114	48.3	17.2	20.4
CITY CABIN	2390	4/01/02	---	15.5E	12.4	11.1	MARIAS PASS	5250	3/28/02	66	22.3	12.1	16.8
COLOCKUM PASS	5370	3/27/02	46	15.9	9.0	16.3	MARTEN LAKE AM	3600	4/01/02	---	100.0E	36.0	71.7
COMBINATION SNOTEL	5600	4/01/02	---	4.5	4.0	4.9	MCULLOCH CAN.	4200	4/02/02	24	6.1	4.2	6.1
COPPER BOTTOM SNOTEL	5200	4/01/02	---	14.3	8.0	11.0	MEADOWS CABIN	1900	3/29/02	28	8.6	.0	4.0
COPPER CAMP	6950	3/27/02	102	33.8	14.7	--	MEADOWS PASS SNOTEL	3240	4/01/02	---	43.8	17.5	23.9
COPPER CREEK	5700	3/27/02	55	16.2	7.6	13.3	MERRITT	2140	3/29/02	39	14.1	3.6	12.1
COPPER MOUNTAIN	7700	3/30/02	31	8.0	9.4	11.2	MICA CREEK SNOTEL	4750	4/01/02	---	35.8	16.9	25.1
CORNER CREEK	3150	3/27/02	41	12.9	5.1	5.9	MINERAL CREEK	4000	4/01/02	55	19.4	10.2	17.4
CORRAL PASS SNOTEL	6000	4/01/02	---	42.1	20.7	34.9	MISSEZULA MTN CAN.	5080	3/29/02	35	10.0	6.0	9.5
COTTONWOOD CREEK	6400	3/27/02	23	5.2	4.7	8.3	MISSION RIDGE	5000	3/27/02	50	17.4	10.9	17.4
COUGAR MTN. SNOTEL	3200	4/01/02	---	31.7	13.2	17.7	MONASHEE PASS CAN.	4500	4/03/02	37	12.3	7.4	13.5
COX VALLEY	4500	3/30/02	119	48.3	17.6	26.7	MORRISSEY RIDGE CAN.	6100	4/01/02	---	34.1	14.2	57.2
COYOTE HILL	4200	3/28/02	35	10.2	6.0	8.7	MORSE LAKE SNOTEL	5400	3/01/02	---	56.1	26.8	57.3
DALY CREEK SNOTEL	5780	4/01/02	---	8.9	6.8	11.1	MOSES MOUNTAIN (2)	4800	3/27/02	43	14.7	--	22.7
DEER PARK	5200	4/01/02	---	22.5E	8.4	18.8	MOSES MTN SNOTEL	4800	4/01/02	---	17.2	7.3	15.9
DESERT MOUNTAIN	5600	3/30/02	48	15.3	9.8	14.7	MOSES PEAK	6650	3/27/02	70	23.1	--	15.0
DEVILS PARK	5900	3/27/02	146	57.6	26.2	44.2	MOSQUITO RDG SNOTEL	5200	4/01/02	---	44.2	18.0	35.8
DISCOVERY BASIN	7050	3/25/02	28	6.7	8.6	10.4	MOULTON RESERVOIR	6850	3/25/02	21	4.6	5.0	6.9
DIX HILL	6400	3/31/02	33	10.3	7.9	10.3	MCUNT CRAG SNOTEL	4050	4/01/02	90	36.2	20.1	30.8
DOMMERIE FLATS	2200	3/28/02	9	4.0	.0	3.8	MT. KOBAY CAN.	5500	3/29/02	41	12.6	8.7	12.5
EAST FORK R.S.	5400	4/01/02	16	3.8	3.3	4.7	MOUNT TOLMAN	2000	3/26/02	3	.6	.0	--
EAST RAGGED SADDLE	3740	3/30/02	73	28.6	14.0	18.1	MOUNT GARDNER SNOTEL	2860	4/01/02	---	28.9	12.0	13.0
EASY PASS AM	5200	4/01/02	---	105.0E	41.0	81.0	MUTTON CREEK #1	5700	4/03/02	41	14.1	6.8	13.9
EL DORADO MINE	7800	3/24/02	51	14.0	14.4	20.2	N.F. ELK CR SNOTEL	6250	4/01/02	---	11.0	9.6	12.4
ELBOW LAKE SNOTEL	3200	4/01/02	118	54.9	21.3	39.2	NEW HOZOMEEN LAKE	2800	3/27/02	40	12.3	4.8	10.0
EMERY CREEK	4350	3/30/02	52	17.8	11.2	--	NEZ PERCE CMP SNOTEL	5650	4/01/02	---	15.1	9.5	14.7
EMERY CREEK SNOTEL	4350	4/01/02	---	15.2	10.3	15.3	NEZ PERCE PASS	6570	3/28/02	46	14.6	9.5	17.8
ENDERBY CAN.	5800	3/27/02	109	46.0	24.4	23.0	NOISY BASIN	6040	3/28/02	122	45.4	25.8	--
ESPERON CK. MID CAN.	4250	3/31/02	43	14.4	7.7	14.6	NOISY BASIN SNOTEL	6040	4/01/02	---	40.5	24.5	40.9
ESPERON CK. UP CAN.	5050	3/31/02	53	19.0	9.6	17.0	NORTH FORK JOCKO	6330	3/26/02	122	44.9	30.5	--
FARRON CAN.	4000	3/28/02	36	12.2	6.4	12.5	OLALLIE MDWS SNOTEL	3960	4/01/02	---	65.6	36.1	55.9
FATTY CREEK	5500	3/26/02	72	23.6	19.0	24.3	OLALLIE MEADOWS	3630	4/03/02	128	58.2	30.2	38.7
FISH CREEK	8000	3/25/02	27	6.1	8.1	9.9	OPHIR PARK	7150	3/31/02	40	12.3	11.5	16.7
FISH LAKE	3370	3/27/02	96	39.4	16.9	31.5	OYAMA LAKE CAN.	4100	3/27/02	28	7.2	4.8	6.7
FISH LAKE SNOTEL	3370	4/01/02	87	35.4	17.0	34.5	PALISADE CREEK	8250	3/28/02	85	30.4	19.7	29.8
FLATTOP MTN SNOTEL	6300	4/01/02	---	51.1	24.0	45.1	PARADISE PARK SNOTEL	5500	4/01/02	---	84.5	42.5	71.9
FLEECER RIDGE	7500	3/28/02	34	9.5	5.5	10.9	PARK CK RIDGE SNOTEL	4600	4/01/02	133	61.5	26.6	47.6
FOURTH OF JULY SUM	3200	3/28/02	46	16.5	4.6	5.7	PETERSON MDW SNOTEL	7200	4/01/02	---	6.3	8.7	10.5
FRED BURR PASS	8000	3/26/02	65	21.0	15.7	23.9	PIGTAIL PEAK SNOTEL	5900	4/01/02	---	18.0	25.2	53.2
FREEZEOUT CK. TRAIL	3500	3/27/02	42	13.9	4.6	11.3	PIKE CREEK	5930	3/28/02	86	29.7	12.5	--
FRONHER MDWS SNOTEL	6480	4/01/02	---	6.3	7.1	8.0	PIKE CREEK SNOTEL	5930	4/01/02	---	30.6	13.3	27.5
GOAT CREEK	3600	4/01/02	11	3.5	1.1	3.6	PIPESTONE PASS	7200	3/29/02	15	2.9	4.2	5.7
GOLD CREEK LAKE	7200	3/24/02	40	10.6	9.6	14.7	POPE RIDGE SNOTEL	3540	4/01/02	---	18.0	10.1	18.4
GRASS MOUNTAIN #2	2900	3/30/02	51	25.0	.0	10.0	POSTILL LAKE CAN.	4200	3/28/02	31	8.9	6.3	8.8
GRAVE CREEK	4300	4/01/02	52	18.0	7.2	--	POTATO HILL SNOTEL	4500	4/01/02	---	37.0	16.2	25.3
GRAVE CRK SNOTEL	4300	4/01/02	52	17.7	8.9	15.6	QUARTZ PEAK SNOTEL	4700	4/01/02	---	24.1	10.8	21.2



SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1971-00
ROUND TOP MTN	4020	3/28/02	49	19.1	5.6	--
RAGGED RIDGE	3330	3/28/02	36	13.2	1.0	4.1
RAINY PASS SNOTEL	4780	4/01/02	---	49.0	23.1	44.0
REX RIVER SNOTEL	1900	4/01/02	---	55.6	18.0	31.2
ROCKER PEAK SNOTEL	8000	4/01/02	---	10.3	11.9	14.3
ROLAND SUMMIT	5120	3/29/02	133	53.4	18.9	36.4
RUSTY CREEK	4000	4/03/02	13	4.2	1.9	5.5
SADDLE MTN SNOTEL	7900	4/01/02	---	23.0	15.0	25.8
SAGE CREEK SADDLE	4080	3/27/02	85	31.1	8.1	16.6
SALMON MDWS SNOTEL	4500	4/01/02	---	10.1	6.4	11.1
SASSE RIDGE SNOTEL	4200	4/01/02	---	45.0	20.9	37.3
SAVAGE PASS SNOTEL	6170	4/01/02	84	28.0	15.0	26.5
SAWMILL RIDGE	4700	3/30/02	100	38.7	19.2	33.5
SHEEP CANYON SNOTEL	4050	4/01/02	---	51.9	19.1	37.8
SHERWIN SNOTEL	3200	4/01/02	---	18.3	5.2	10.1
SILVER STAR MTN CAN.	5600	3/30/02	83	32.6	18.3	27.3
SKALKAHO SNOTEL	7260	4/01/02	---	23.7	13.4	24.3
SKITWISH RIDGE	5110	3/27/02	114	42.4	17.3	30.2
SKOOKUM CREEK SNOTEL	3920	4/01/02	---	59.0	14.7	26.3
SLIDE ROCK MOUNTAIN	7100	3/23/02	45	12.0	7.4	15.5
SOURDOUGH GULCH SNTL	4000	4/01/02	0	.0	.0	--
SPENCER MDW SNOTEL	3400	4/01/02	---	54.7	19.4	30.8
SPIRIT LAKE SNOTEL	3100	4/01/02	---	14.8	.0	3.6
SPOTTED BEAR MTN.	7000	4/02/02	45	14.1	11.6	14.1
SOURDOUGH GULCH SNTL	4000	4/01/02	0	.0	.0	--
STAHL PEAK SNOTEL	6030	4/01/02	---	41.5	17.2	35.3
STAMPEDE PASS SNOTEL	3860	4/01/02	---	59.3	27.7	45.3
STEMILT SLIDE	5000	3/29/02	38	13.3	6.7	12.9
STEMPLE PASS	6600	3/27/02	38	9.4	6.0	10.2
STEVENS PASS SNOTEL	4070	4/01/02	---	47.2	23.2	42.6
STEVENS PASS SAND SD	3700	3/29/02	101	37.1	20.8	33.3
STORM LAKE	7780	3/25/02	39	9.7	10.2	13.3

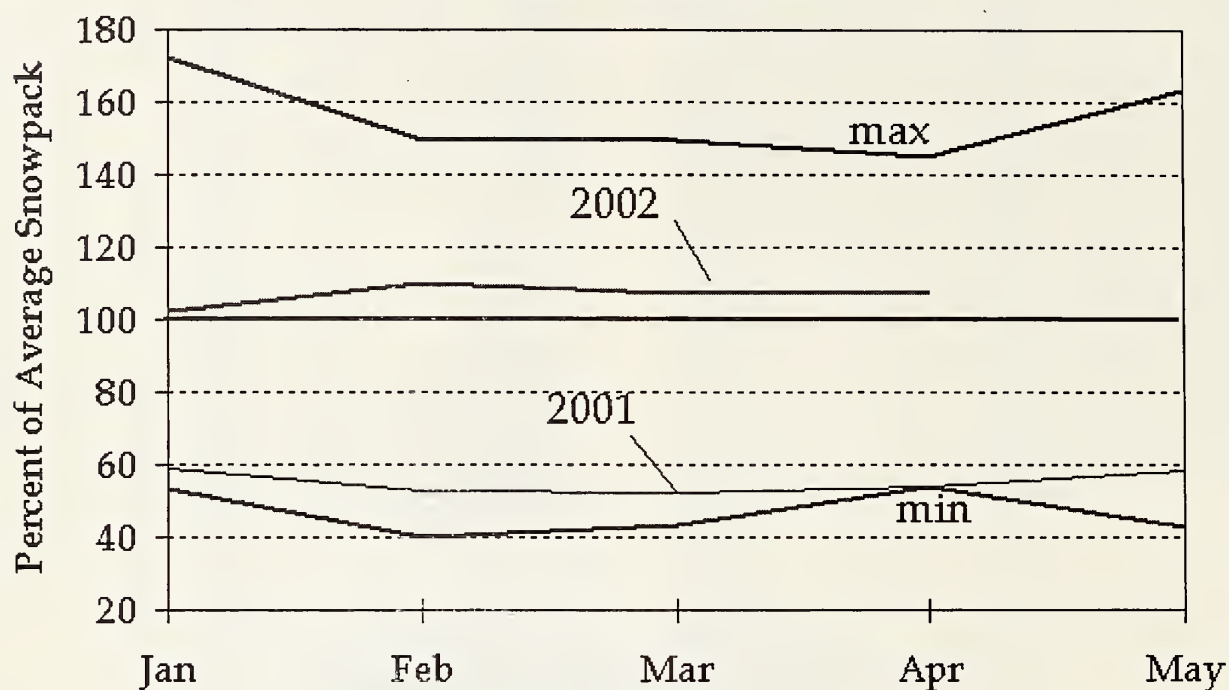
SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1971-00
STRANGER MOUNTAIN	4230	3/29/02	41	15.0	8.2	12.2
STRYKER BASIN	6180	3/28/02	100	36.8	15.1	31.9
STUART MOUNTAIN	7400	3/26/02	94	35.3	22.2	--
SUMMERLAND RES CAN.	4200	3/27/02	32	9.4	4.6	9.1
SUMMIT G.S.	4600	4/01/02	24	6.7	6.2	7.4
SUNSET SNOTEL	5540	4/01/02	---	24.8	14.3	31.5
SURPRISE LKS SNOTEL	4250	4/01/02	---	58.4	30.1	46.1
TEN MILE LOWER	6600	3/25/02	23	4.9	5.4	7.0
TEN MILE MIDDLE	6800	3/25/02	30	7.2	7.8	11.4
THUNDER BASIN	4200	3/29/02	83	28.6	13.0	21.9
TINKHAM CREEK SNOTEL	3000	4/01/02	---	40.9	20.1	30.0
TOGO	3370	3/29/02	36	12.2	6.5	10.7
TOUCHET SNOTEL	5530	4/01/02	99	42.8	21.4	34.7
TRINKUS LAKE	6100	4/02/02	109	44.7	28.3	42.0
TROUGH #2 SNOTEL	5310	4/01/02	23	8.2	6.5	10.0
TROUT CREEK CAN.	5650	3/28/02	30	7.4	4.6	7.2
TRUMAN CREEK	4060	3/26/02	23	5.9	3.4	3.7
TUNNEL AVENUE	2450	3/26/02	66	27.2	15.0	19.2
TV MOUNTAIN	6800	3/26/02	58	18.6	13.0	18.5
TWELVEMILE SNOTEL	5600	4/01/02	---	19.6	9.0	17.5
TWIN CAMP	4100	3/30/02	67	27.3	12.3	24.1
TWIN CREEKS	3580	4/02/02	34	11.6	8.0	9.6
TWIN LAKES	2700	3/28/02	21	6.6	1.8	4.6
TWIN LAKES SNOTEL	6400	4/01/02	---	46.2	23.6	39.7
TWIN SPIRIT DIVIDE	3480	3/30/02	46	17.8	8.8	12.1
UPPER HOLLAND LAKE	6200	4/02/02	101	38.7	21.4	34.6
UPPER WHEELER SNOTEL	4400	4/01/02	---	10.6	9.9	13.1
VASEUX CREEK CAN.	4250	4/02/02	16	4.3	2.8	6.3
WARM SPRINGS SNOTEL	7800	4/01/02	---	18.5	15.2	21.2
WEASEL DIVIDE	5450	4/01/02	101	40.0	12.3	32.9
WELLS CREEK SNOTEL	4200	4/01/02	93	38.5	18.6	--
WHITE PASS ES SNOTEL	4500	4/01/02	---	28.0	11.9	23.9
WHITE ROCKS MTN CAN.	7200	4/01/02	72	26.6	12.5	23.0

# April 1, 2002 - Snowpack and Precipitation Conditions at a Glance (Water Year = October 1, 2001 - Current Date)

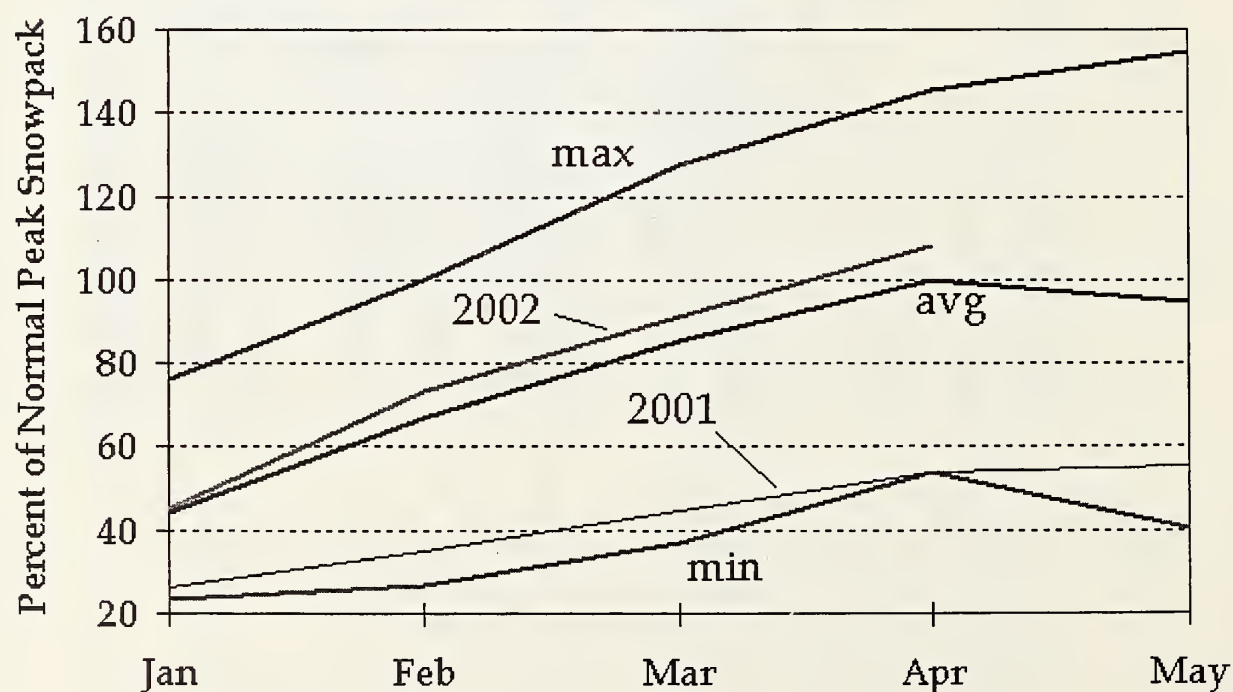


# Columbia Basin Snowpack Graphs - Water Year 2002

Columbia above The Dalles



Columbia above The Dalles





Natural Resources Conservation Service

Washington State  
Snow, Water and Climate Services

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**Helpful Internet Addresses**

**NRCS Snow Survey and Climate Services Homepages**

Washington:

<http://www.wa.nrcs.usda.gov/snow/snow.htm>

Oregon:

<http://www.or.nrcs.usda.gov/snow/snow.htm>

Idaho:

<http://idsnow.id.nrcs.usda.gov>

National Water and Climate Center (NWCC):

<http://www.wcc.nrcs.usda.gov>

NWCC Anonymous FTP Server:

<ftp.wcc.nrcs.usda.gov>

**USDA-NRCS Agency Homepages**

Washington:

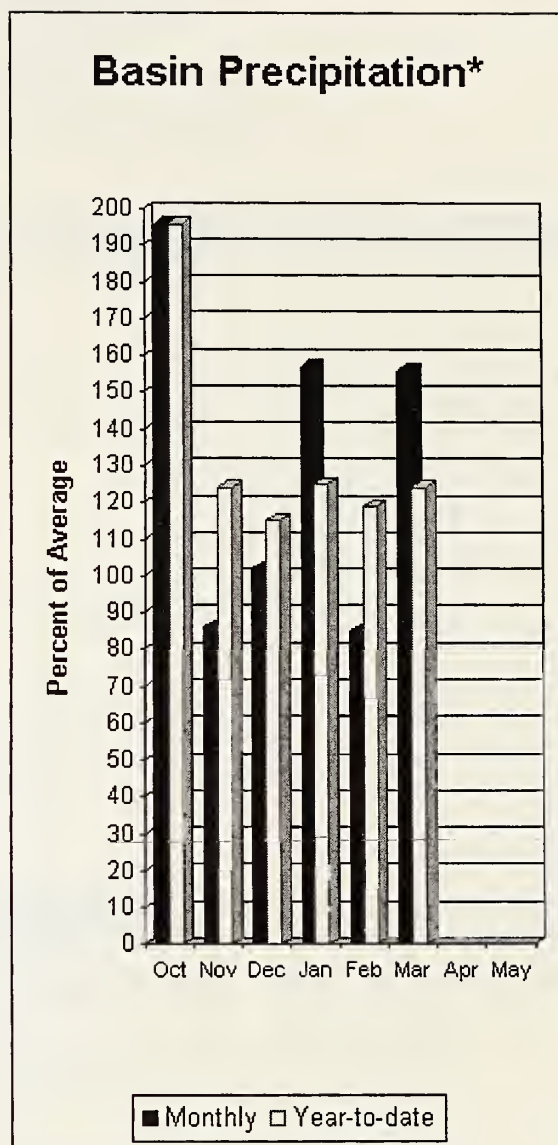
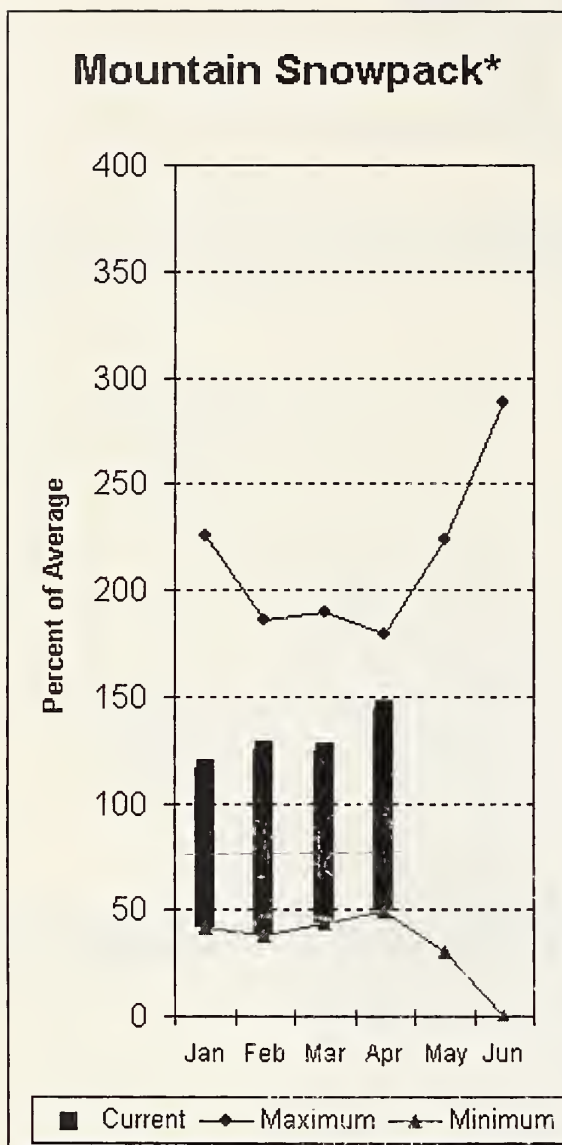
<http://www.wa.nrcs.usda.gov/nrcs>

NRCS National:

<http://www.ftw.nrcs.usda.gov>



## Spokane River Basin



\*Based on selected stations

The April 1 forecasts for summer runoff within the Spokane River Basin are 133% of average at both Post Falls and Long Lake. The forecast is based on a basin snowpack that is 144% of average and precipitation that is 124% of average for the water year. Precipitation for March was above normal at 156% of average. Streamflow on the Spokane River at Long Lake, was 85% of average for March. April 1 storage in Coeur d'Alene Lake, was 143,000-acre feet, 84% of average and 60% of capacity. Snowpack at Quartz Peak SNOTEL site was 114% of average with 24.1 inches of water content. Average temperatures in the Spokane Basin were 4 degrees below normal for March and near average for the water year.

*For more information contact your local Natural Resources Conservation Service office.*

# Spokane River Basin

## SPOKANE RIVER BASIN Streamflow Forecasts - April 1, 2002

		<<===== Drier ===== Future Conditions ===== Wetter =====>>						
Forecast Point	Forecast Period	Chance Of Exceeding *						30-Yr Avg. (1000AF)
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	
SPOKANE near Post Falls (2)	APR-SEP	3022	3313	3510	133	3707	3998	2650
	APR-JUL	2912	3191	3380	132	3569	3848	2552
SPOKANE at Long Lake (2)	APR-JUL	3226	3563	3792	133	4021	4358	2851
	APR-SEP	3487	3844	4086	133	4328	4685	3072

SPOKANE RIVER BASIN Reservoir Storage (1000 AF) - End of March					SPOKANE RIVER BASIN Watershed Snowpack Analysis - April 1, 2002			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
COEUR D'ALENE	238.5	142.5	118.5	169.5	SPOKANE RIVER	19	255	142
					NEWMAN LAKE	2	316	147

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1971-2000 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.  
 (2) - The value is natural flow. - actual flow may be affected by upstream water management.

Spokane River Basin  
Percent of Average  
April 1, 2002

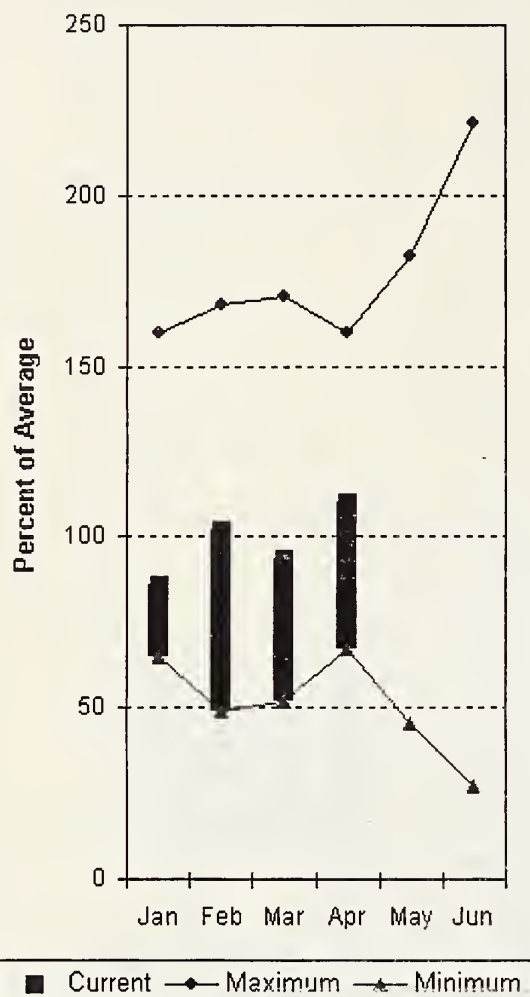
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Snowpack - 144%  
 Precipitation - 124%  
 Reservoir Capacity - 60%

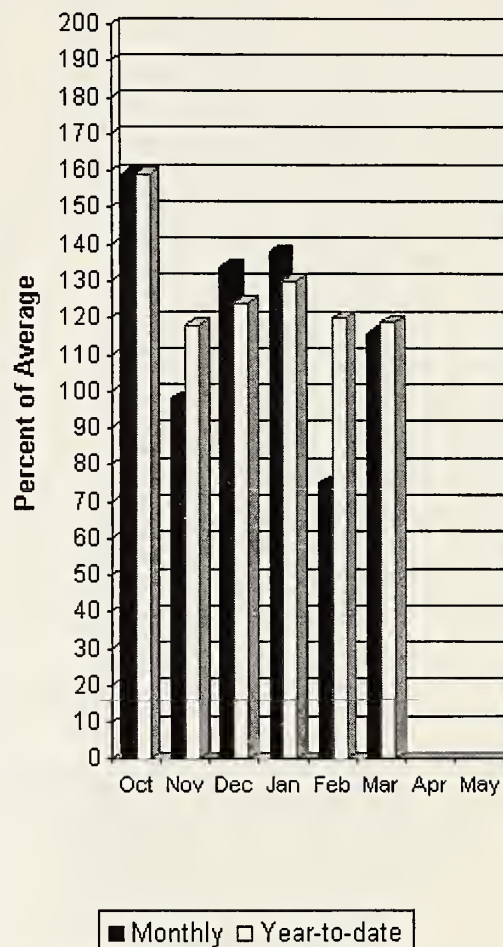


## Colville - Pend Oreille River Basins

### Mountain Snowpack\*



### Basin Precipitation\*



\*Based on selected stations

The April – September average forecast for the Kettle River streamflow is 104%, Colville at Kettle Falls is 93% and Priest River near the town of Priest River is 102%. March streamflow was 67% of average on the Pend Oreille River, 77% on the Columbia at the International Boundary and 46% on the Kettle River. April 1 snow cover was 102% of average in the Pend Oreille Basin and 94% in the Kettle River Basin. Bunchgrass Meadows SNOTEL site had 32.7 inches of snow water on the snow pillow. Normally, Bunchgrass would have 30.2 inches on April 1. Precipitation during March was 116% of average, bringing the year-to-date precipitation to 119% of average. Reservoir storage in Roosevelt Lake was reported to be 117% of average and 54% of capacity on April 1. Average temperatures were 4 degrees below normal for March and near average for the water year.

*For more information contact your local Natural Resources Conservation Service office.*



# Colville - Pend Oreille River Basins

## Streamflow Forecasts - April 1, 2002

		<<----- Drier ----- Future Conditions ----- Wetter ----->>							
Forecast Point	Forecast Period	-----		Chance Of Exceeding *		-----		30-Yr Avg. (1000AF)	
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF) (% AVG.)	30% (1000AF)	10% (1000AF)			
PEND OREILLE Lake Inflow (2)	APR-JUL	10452	11672	12500	98	13328	14548	12700	
	APR-SEP	10690	12423	13600	98	14777	16510	13900	
PRIEST near Priest River (1,2)	APR-JUL	699	789	830	102	871	961	814	
	APR-SEP	741	840	885	102	930	1029	868	
PEND OREILLE bl Box Canyon (2)	APR-JUL	10624	11741	12500	97	13259	14376	12900	
	APR-SEP	10646	12405	13600	97	14795	16554	14100	
CHAMOKANE CREEK near Long Lake	MAY-AUG	5.4	7.5	9.0	88	10.5	12.6	10.2	
COLVILLE at Kettle Falls	APR-SEP	95	116	131	93	146	167	141	
	APR-JUL	86	106	119	93	132	152	128	
KETTLE near Laurier	APR-SEP	1765	1935	2050	104	2165	2335	1972	
	APR-JUL	1699	1849	1950	104	2051	2201	1874	
COLUMBIA at Birchbank (1,2)	APR-JUL	28908	31791	33100	95	34409	37292	34900	
	APR-SEP	35944	39559	41200	95	42841	46456	43500	
COLUMBIA at Grand Coulee Dm (1,2)	APR-SEP	54645	60666	63400	99	66134	72155	63990	
	APR-JUL	46432	51361	53600	100	55839	60768	53850	

### COLVILLE - PEND OREILLE RIVER BASINS Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage ***		
		This Year	Last Year	Avg
ROOSEVELT	5232.0	2810.9	710.9	2397.5
BANKS		NO REPORT		

### COLVILLE - PEND OREILLE RIVER BASINS Watershed Snowpack Analysis - April 1, 2002

Watershed	Number of Data Sites	This Year as % of	
		Last Yr	Average
COLVILLE RIVER	2	185	119
PEND OREILLE RIVER	102	171	102
KETTLE RIVER	8	158	93

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

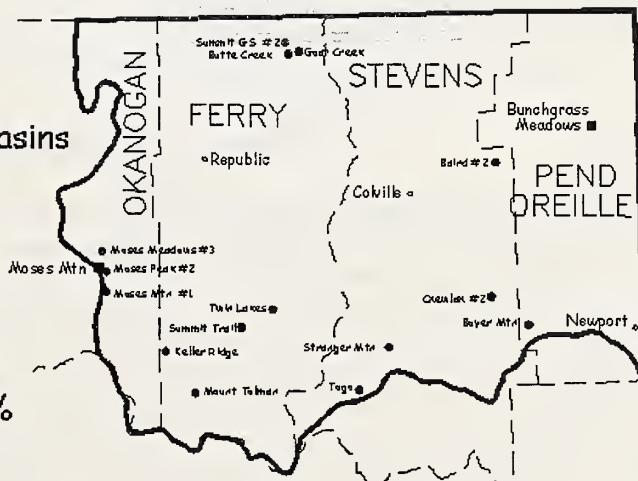
The average is computed for the 1971-2000 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.

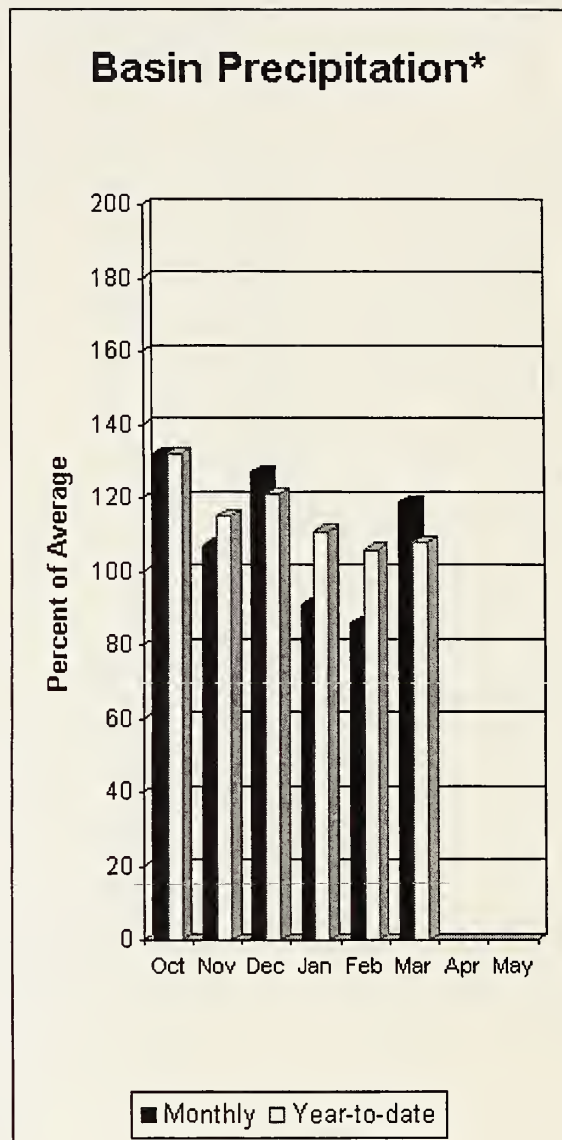
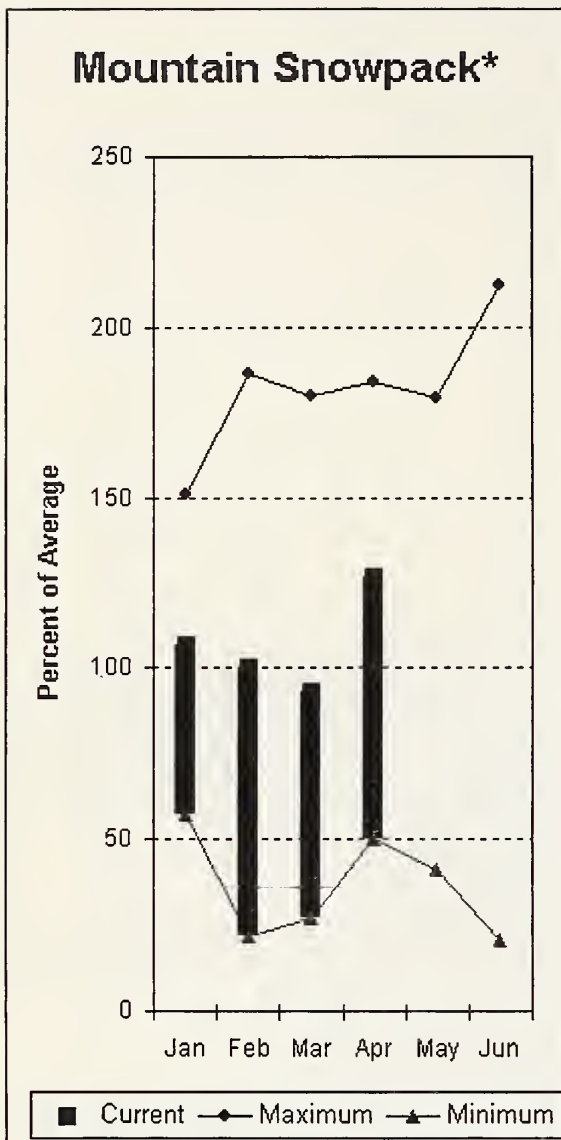
(2) - The value is natural flow - actual flow may be affected by upstream water management.

Colville-Pend Oreille River Basins  
Percent of Average  
April 1, 2002

Snowpack - 110%  
Precipitation - 119%  
Reservoir Capacity - 54%



## Okanogan - Methow River Basins



\*Based on selected stations

Summer runoff average forecast for the Okanogan River is 95%, Similkameen River is 97%, Methow River is 106% and Salmon Creek is 98%. April 1 snow cover on the Okanogan was 111% of average and Methow was 104%. Snowpack above Conconully Lake was only 93% of average. March precipitation in the Okanogan-Methow was 119% of average, with precipitation for the water year at 108% of average. March streamflow for the Methow River was 75% of average, 64% for the Okanogan River and 73% for the Similkameen. Snow-water content at Harts Pass SNOTEL was 47.9 inches. Average for this site is 46.3 inches on April 1. Combined storage in the Conconully reservoirs was 7,000-acre feet, which is 30% of capacity and 40% of the April 1 average. Temperatures were 4 degrees below normal for the past month and 1-2 degrees above average for the water year.

For more information contact your local Natural Resources Conservation Service office.

# Okanogan - Methow River Basins

## OKANOGAN - METHOW RIVER BASINS Streamflow Forecasts - April 1, 2002

Forecast Point	Forecast Period	<<----- Drier ----->>		Future Conditions		----- Wetter ----->>		30-Yr Avg. (1000AF)
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	Chance Of Exceeding * (% AVG.)	30% (1000AF)	10% (1000AF)	
SIMILKAMEEN near Nighthawk (1)	APR-JUL	989	1210	1310	97	1410	1631	1350
	APR-SEP	1073	1305	1410	97	1515	1747	1450
OKANOGAN near Tonasket (1)	APR-JUL	933	1316	1490	94	1664	2047	1580
	APR-SEP	1051	1477	1670	95	1863	2289	1766
SALMON CREEK near Conconully	APR-JUL	7.9	14.9	19.6	98	24	31	20
	APR-SEP	8.3	15.6	21	98	26	33	21
BEAVER CREEK below SF near Twisp	APR-SEP	8.7	11.3	13.0	107	14.7	17.3	12.1
	APR-JUL	7.8	10.3	12.0	108	13.7	16.2	11.1
METHOW RIVER near Pateros	APR-SEP	923	992	1040	106	1088	1157	985
	APR-JUL	861	924	966	106	1008	1071	911

## OKANOGAN - METHOW RIVER BASINS Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
SALMON LAKE	10.5	3.5	6.9	8.4	OKANOGAN RIVER	23	185	111
CONCONULLY RESERVOIR	13.0	3.6	6.6	9.2	OMAK CREEK	3	236	103
					SANPOIL RIVER	1	261	143
					SIMILKAMEEN RIVER	3	158	104
					TOATS COULEE CREEK	0	0	0
					CONCONULLY LAKE	3	188	93
					METHOW RIVER	5	210	104

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1971-2000 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.

(2) - The value is natural flow - actual flow may be affected by upstream water management.

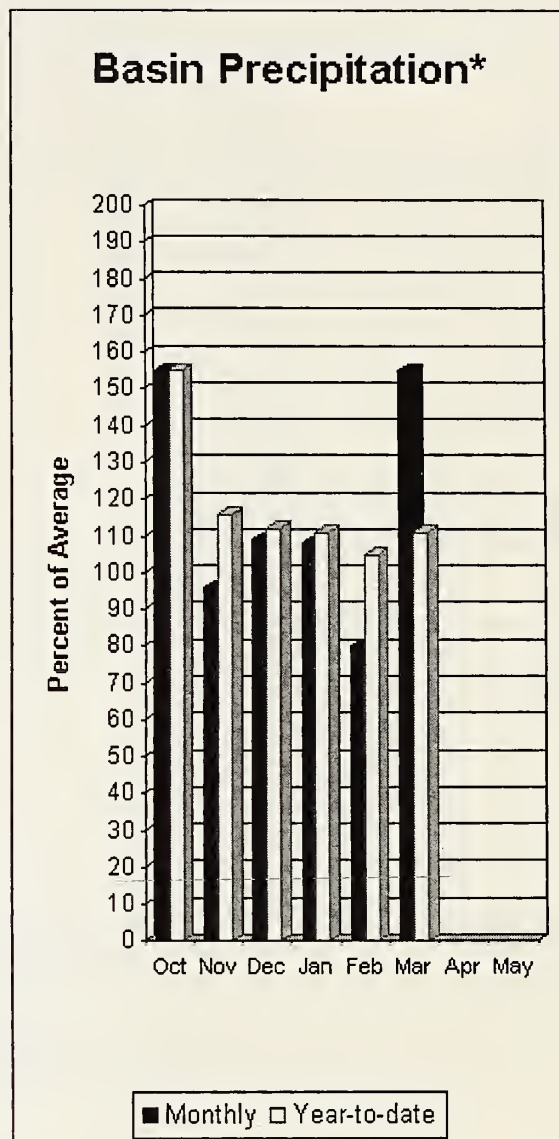
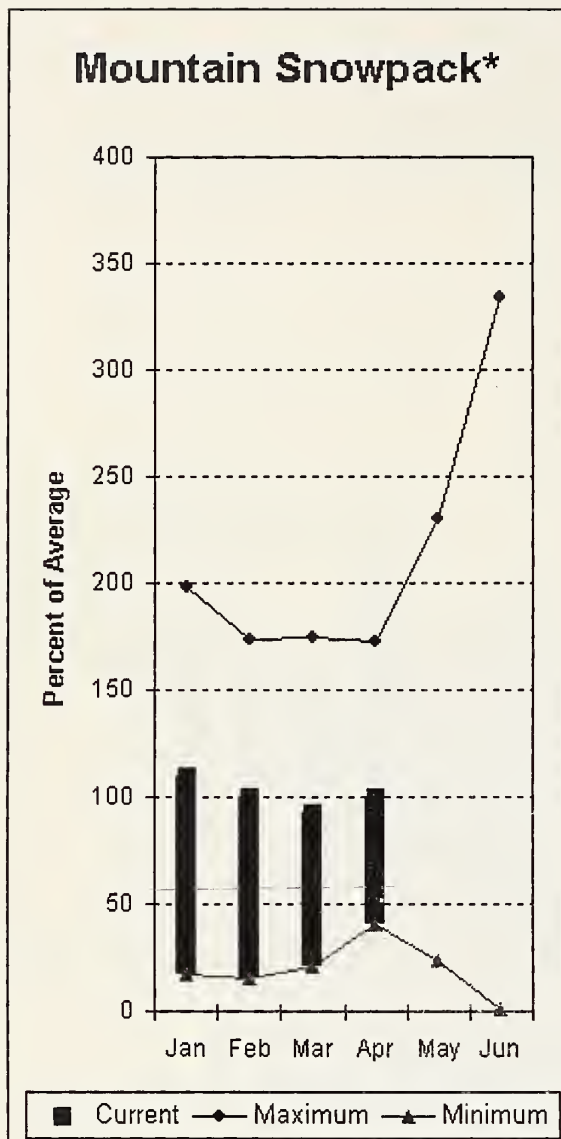
## Okanogan-Methow River Basins Percent of Average April 1, 2002

Snowpack - 127%  
Precipitation - 108%  
Reservoir Capacity - 30%





## Wenatchee - Chelan River Basins



\*Based on selected stations

Precipitation during March was 155% of average in the basin and 111% for the year-to-date. Runoff for Entiat River is forecast to be 102% of average for the summer. The April-September average forecast for Chelan River is 109%, Wenatchee River at Plain is 105% and Stehekin is 100%. Icicle, Stemilt, and Squilchuck creeks are all expected to fall into the same forecast range with near normal flows. March average streamflows on the Chelan River were 78% and on the Wenatchee River 80%. April 1 snowpack in the Wenatchee River Basin was 109% of average; the Chelan, 120%; the Entiat, 86%; Stemilt Creek, 92%; and Colockum Creek, 92%. Reservoir storage in Lake Chelan was 187,000-acre feet, 87% of April 1 average and 28% of capacity. Lyman Lake SNOTEL had the most snow water with 73.3 inches of water. This site normally has 65.4 inches on April 1. Temperatures were 4 degrees below normal for March and 1-2 degrees above normal for the water year.

*For more information contact your local Natural Resources Conservation Service office.*

# Wenatchee - Chelan River Basins

## Streamflow Forecasts - April 1, 2002

Forecast Point	Forecast Period	<<----- Drier -----		Future Conditions		----- Wetter ----->>		30-Yr Avg. (1000AF)
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	Chance Of Exceeding * (% AVG.)	30% (1000AF)	10% (1000AF)	
CHELAN RIVER near Chelan	APR-SEP	1154	1235	1290	109	1345	1426	1185
	APR-JUL	1034	1103	1150	110	1197	1266	1046
STEHEKIN near STEHEKIN	APR-SEP	804	861	900	109	939	996	827
	APR-JUL	692	738	769	110	800	846	699
ENTIAT RIVER near Ardenvoir	APR-SEP	217	232	242	102	252	267	238
	APR-JUL	197	211	221	102	231	245	216
WENATCHEE at Plain	APR-SEP	1113	1198	1256	105	1314	1399	1198
	APR-JUL	1011	1079	1125	104	1171	1239	1078
WENATCHEE R. at Peshastin	APR-SEP	1277	1519	1684	103	1849	2091	1635
	APR-JUL	1059	1336	1525	103	1714	1991	1481
STEMILT nr Wenatchee (miners in)	MAY-SEP	94	120	138	100	156	182	138
ICICLE CREEK near Leavenworth	APR-SEP	324	347	362	105	377	400	345
	APR-JUL	304	322	335	105	348	366	318
COLUMBIA R. bl Rock Island Dam (2)	APR-SEP	62755	67128	70100	101	73072	77445	69540
	APR-JUL	51824	56514	59700	101	62886	67576	59020

### WENATCHEE - CHELAN RIVER BASINS Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage ***		
		This Year	Last Year	Avg
CHELAN LAKE	676.1	187.2	405.2	216.3

### WENATCHEE - CHELAN RIVER BASINS Watershed Snowpack Analysis - April 1, 2002

Watershed	Number of Data Sites	This Year as % of	
		Last Yr	Average
CHELAN LAKE BASIN	4	223	120
ENTIAT RIVER	1	178	98
WENATCHEE RIVER	12	195	109
SQUILCHUCK CREEK	0	0	0
STEMILT CREEK	2	126	80
COLOCKUM CREEK	2	155	92

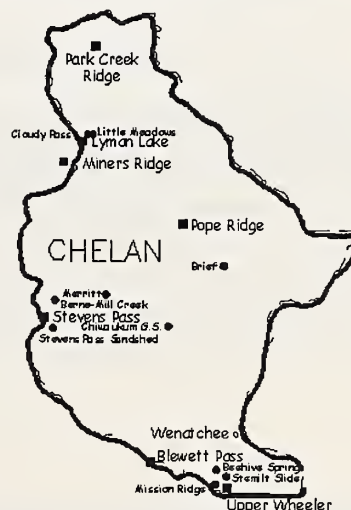
\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1971-2000 base period.

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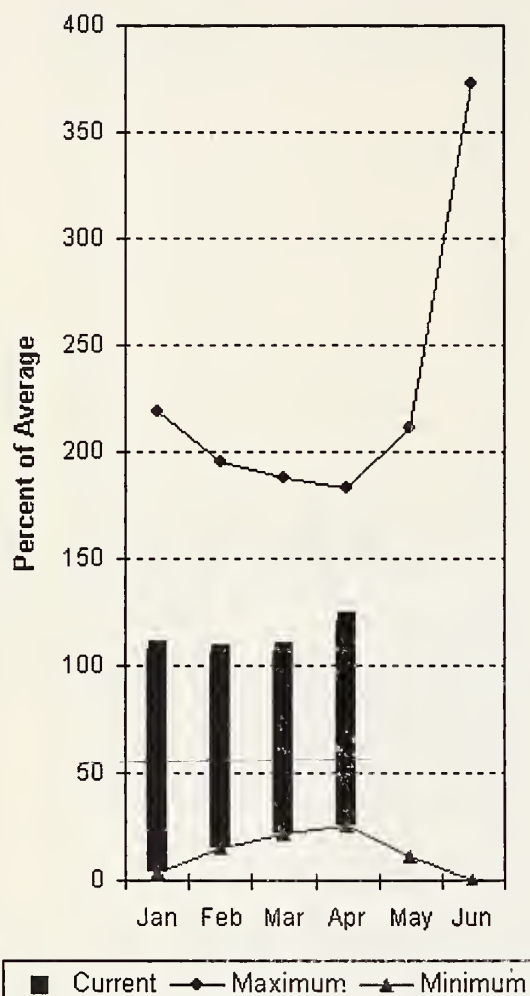
Wenatchee-Chelan River Basins  
Percent of Average  
April 1, 2002

Snowpack - 100%  
Precipitation - 111%  
Reservoir Capacity - 28%

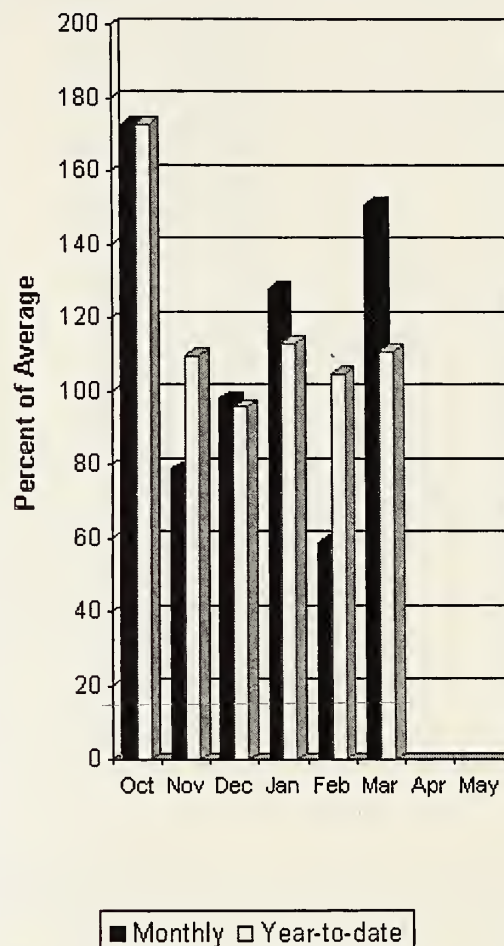


# Upper Yakima River Basin

## Mountain Snowpack\*



## Basin Precipitation\*



\*Based on selected stations

April 1 reservoir storage for the Upper Yakima reservoirs was 409,000-acre feet, 74% of average. Forecasts for the Yakima River at Cle Elum are 115% of average and the Teanaway River near Cle Elum is at 110%. Lake inflows are all forecasted to be near or above average this summer. March streamflows within the basin were Yakima near Cle Elum at 76% and Cle Elum River near Roslyn at 71%. April 1 snowpack was 121% based upon 12 snow courses and SNOTEL readings within the Upper Yakima Basin. Precipitation was 151% of average for March and 111% year-to-date for water. Volume forecasts for the Yakima Basin are for natural flow. As such, they may differ from the U.S. Bureau of Reclamation's forecast for the total water supply available, which includes irrigation return flow.

*For more information contact your local Natural Resources Conservation Service office.*



# Upper Yakima River Basin

## Streamflow Forecasts - April 1, 2002

Forecast Point	Forecast Period	<<----- Drier -----		Future Conditions		----- Wetter ----->>		30-Yr Avg. (1000AF)
		90%	70%	50% (Most Probable)	Chance Of Exceeding *	30%	10%	
		(1000AF)	(1000AF)	(1000AF)	(% AVG.)	(1000AF)	(1000AF)	
KEECHELUS LAKE INFLOW	APR-JUL	127	137	144	119	151	161	121
	APR-SEP	135	147	155	117	163	175	133
KACHESS LAKE INFLOW	APR-JUL	120	128	133	120	138	146	111
	APR-SEP	125	134	140	117	146	155	120
CLE ELUM LAKE INFLOW	APR-JUL	408	430	445	109	460	482	408
	APR-SEP	443	468	485	108	502	527	448
YAKIMA at Cle Elum	APR-JUL	885	927	955	116	983	1025	822
	APR-SEP	961	1008	1040	115	1072	1119	903
TEANAWAY near Cle Elum	APR-JUL	137	149	157	110	165	177	143
	APR-SEP	125	146	161	110	176	197	146

### UPPER YAKIMA RIVER BASIN Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage ***		
		This Year	Last Year	Avg
KEECHELUS	157.8	97.4	33.6	114.1
KACHESS	239.0	113.8	132.9	169.4
CLE ELUM	436.9	198.2	102.9	270.1

### UPPER YAKIMA RIVER BASIN Watershed Snowpack Analysis - April 1, 2002

Watershed	Number of Data Sites	This Year as % of	
		Last Yr	Average
UPPER YAKIMA RIVER	12	200	121

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1971-2000 base period.

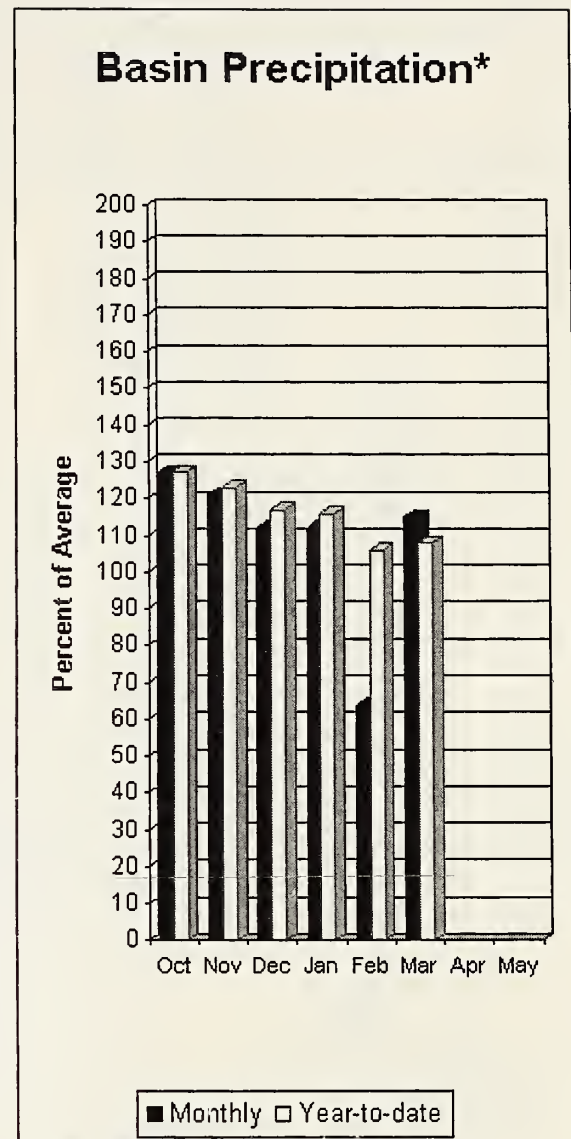
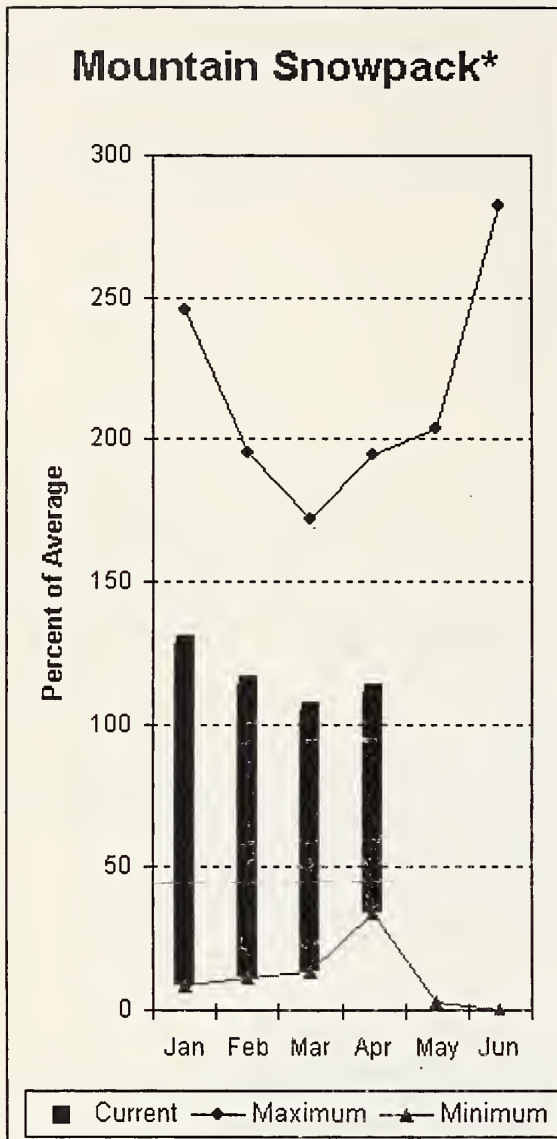
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 (2) - The value is natural flow - actual flow may be affected by upstream water management.



## Upper Yakima River Basin Percent of Average April 1, 2002

Snowpack - 121%  
 Precipitation - 111%  
 Reservoir Capacity - 49%

## Lower Yakima River Basin



\*Based on selected stations

March average streamflows within the basin were: Yakima River near Parker, 68%; Naches River near Naches, 65%; and Yakima River at Kiona, 54%. April 1 reservoir storage for Bumping and Rimrock reservoirs was 132,000-acre feet, 87% of average. Forecast average flows for Yakima River near Parker are 114%; American River near Nile, 109%; Ahtanum Creek, 107% and Klickitat River near Glenwood, 110%. April 1 snowpack was 111% based upon 8 snow courses and SNOTEL readings within the Lower Yakima Basin. Precipitation was 115% of average for March and 108% year-to-date for water. Temperatures were 4 degrees below normal for the month and 1-2 degrees above average for the water year. Volume forecasts for Yakima Basin are for natural flow. As such, they may differ from the U.S. Bureau of Reclamation's forecast for the total water supply available, which includes irrigation return flow.

For more information contact your local Natural Resources Conservation Service office.

# Lower Yakima River Basin

## Streamflow Forecasts - April 1, 2002

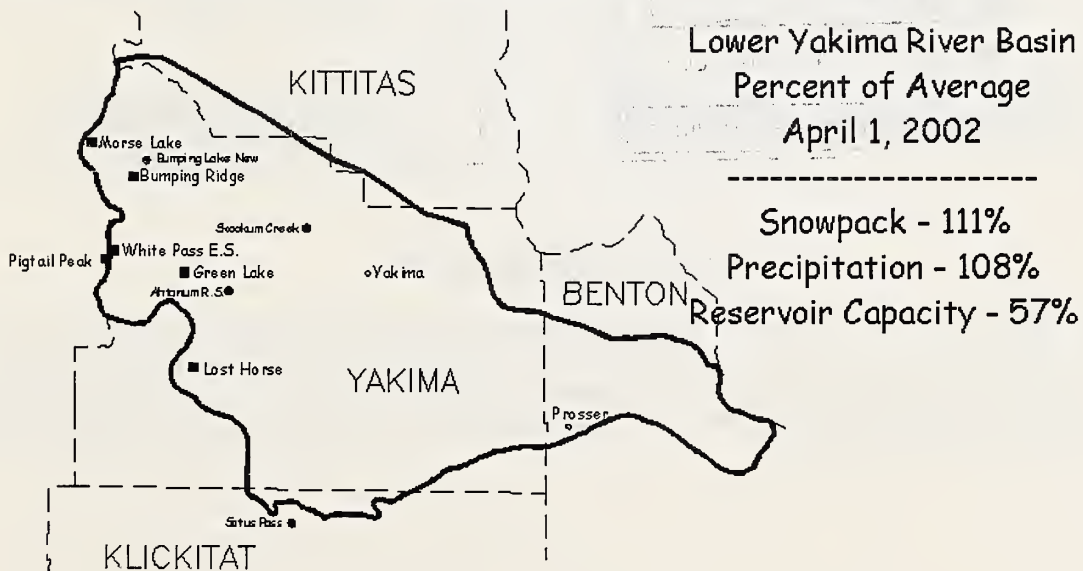
Forecast Point	Forecast Period	<<----- Drier ----- Future Conditions ----- Wetter ----->>						30-Yr Avg. (1000AF)
		90% (1000AF)	70% (1000AF)	Chance Of Exceeding *		30% (1000AF)	10% (1000AF)	
BUMPING LAKE INFLOW	APR-SEP	137	145	150	112	155	163	134
	APR-JUL	125	132	137	112	142	149	122
AMERICAN RIVER near Nile	APR-SEP	117	124	129	109	134	141	118
	APR-JUL	106	113	118	109	123	130	108
RIMROCK LAKE INFLOW	APR-SEP	235	250	260	107	270	285	242
	APR-JUL	201	212	220	108	228	239	204
NACHES near Naches	APR-SEP	832	875	905	108	935	978	837
	APR-JUL	751	793	822	108	851	893	758
AHTANUM CREEK nr Tampico (2)	APR-SEP	32	42	49	107	56	66	46
	APR-JUL	30	39	45	107	51	60	42
YAKIMA near Parker	APR-SEP	2021	2122	2190	114	2258	2359	1918
	APR-JUL	1826	1915	1975	114	2035	2124	1731
KLICKITAT near Glenwood	APR-JUN	127	136	142	110	148	157	129
	APR-SEP	157	170	179	110	188	201	163

LOWER YAKIMA RIVER BASIN Reservoir Storage (1000 AF) - End of March					LOWER YAKIMA RIVER BASIN Watershed Snowpack Analysis - April 1, 2002		
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of Last Yr Average
		This Year	Last Year	Avg			
BUMPING LAKE	33.7	15.5	5.7	13.1			
RIMROCK	198.0	116.2	112.4	138.5			

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

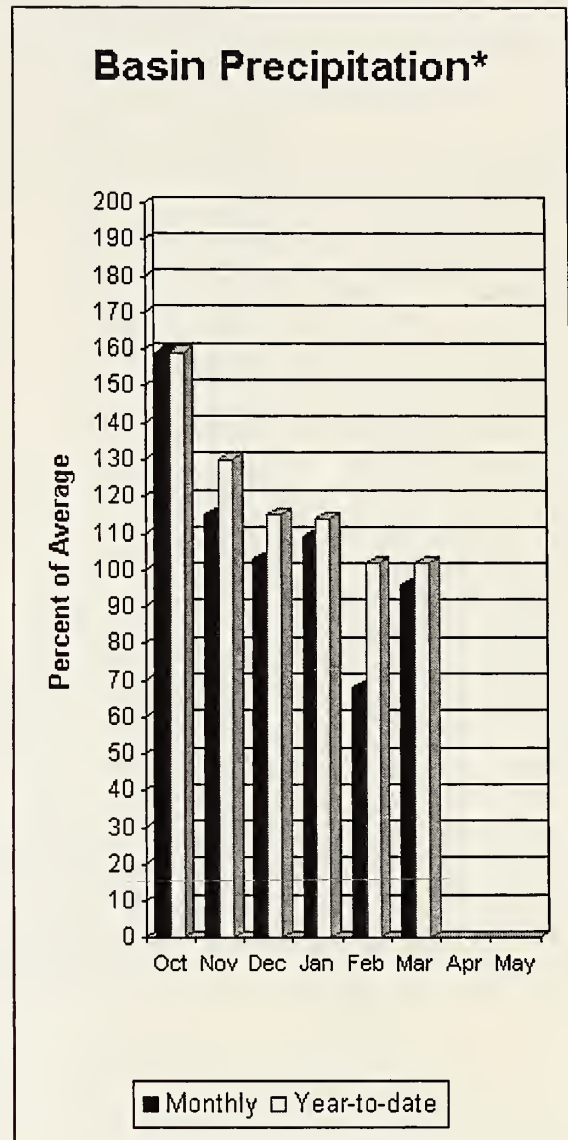
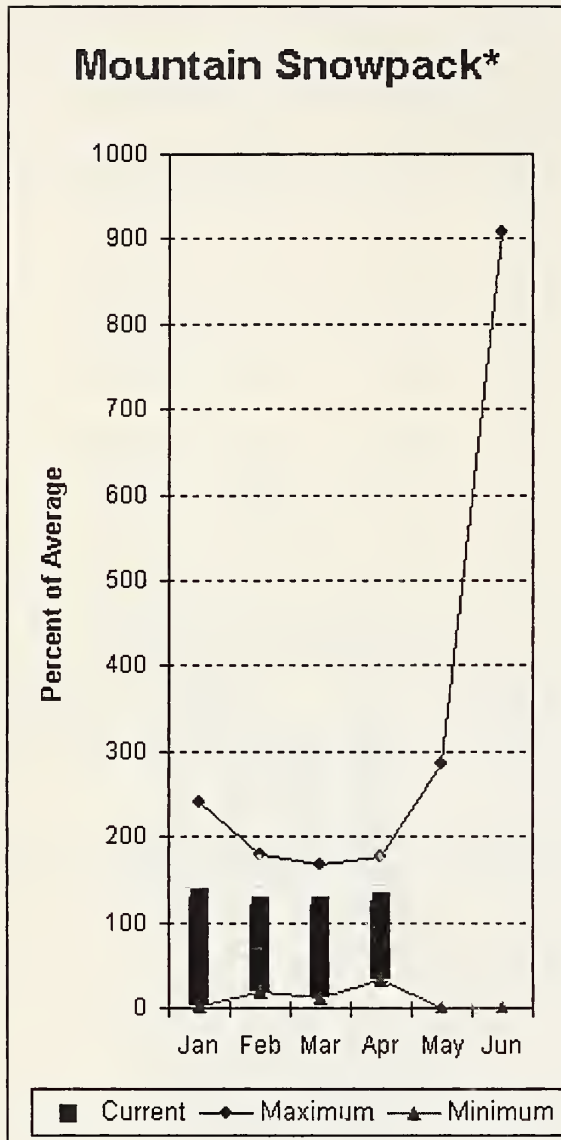
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# Walla Walla River Basin



\*Based on selected stations

March precipitation was 96% of average, maintaining the year-to-date precipitation at 102% of average. Snowpack in the basin was 126% of average. Streamflow forecasts are 109% of average for Mill Creek and 99% for the SF Walla Walla near Milton-Freewater. March streamflow was 127% of average for the Walla Walla River. Average temperatures were 3-4 degrees below normal for March and have remained near normal throughout the water year.

*For more information contact your local Natural Resources Conservation Service office.*

# Walla Walla River Basin

## Streamflow Forecasts - April 1, 2002

Forecast Point	Forecast Period	<<----- Drier ----- Future Conditions ----- Wetter ----->>						30-Yr Avg. (1000AF)
		90% (1000AF)	70% (1000AF)	Chance Of Exceeding *		30% (1000AF)	10% (1000AF)	
MILL CREEK at Walla Walla	APR-SEP	14.0	17.6	20	109	22	26	18.4
	APR-JUL	13.7	17.3	19.7	108	22	26	18.2
SF WALLA WALLA near Milton-Freewater	APR-JUL	45	49	53	99	56	60	53
	APR-SEP	56	61	65	99	69	74	66

WALLA WALLA RIVER BASIN Reservoir Storage (1000 AF) - End of March					WALLA WALLA RIVER BASIN Watershed Snowpack Analysis - April 1, 2002			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
					WALLA WALLA RIVER	2	207	126

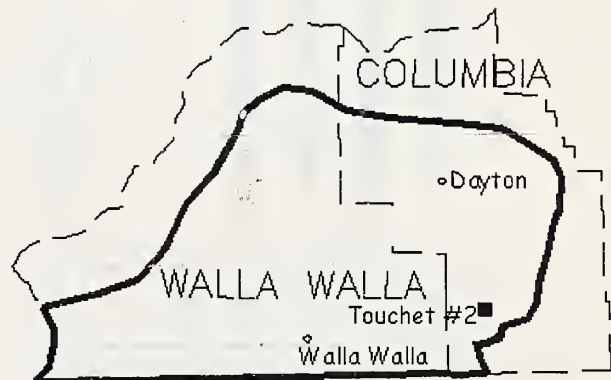
\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1971-2000 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.  
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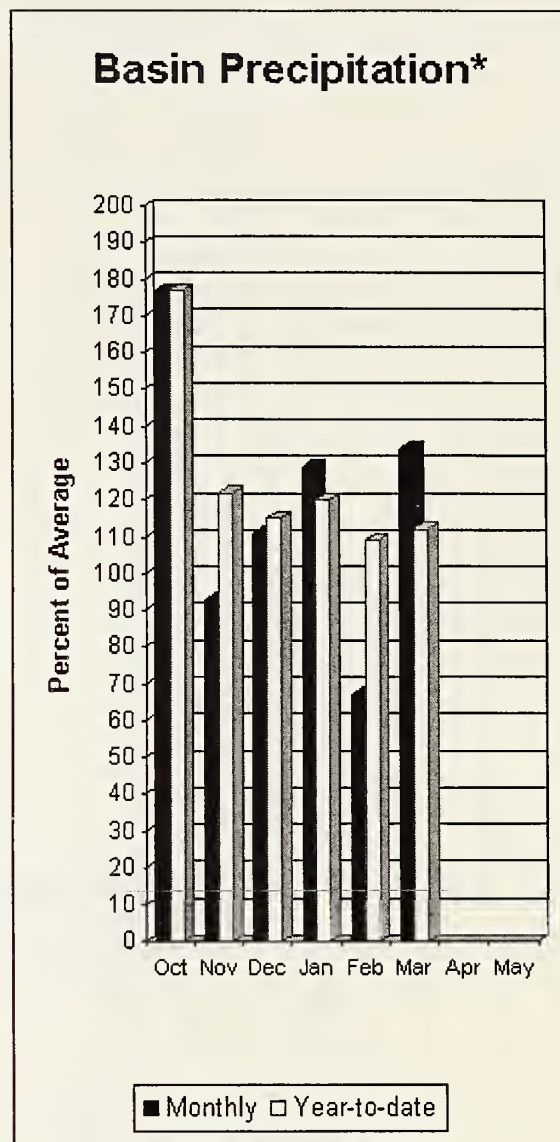
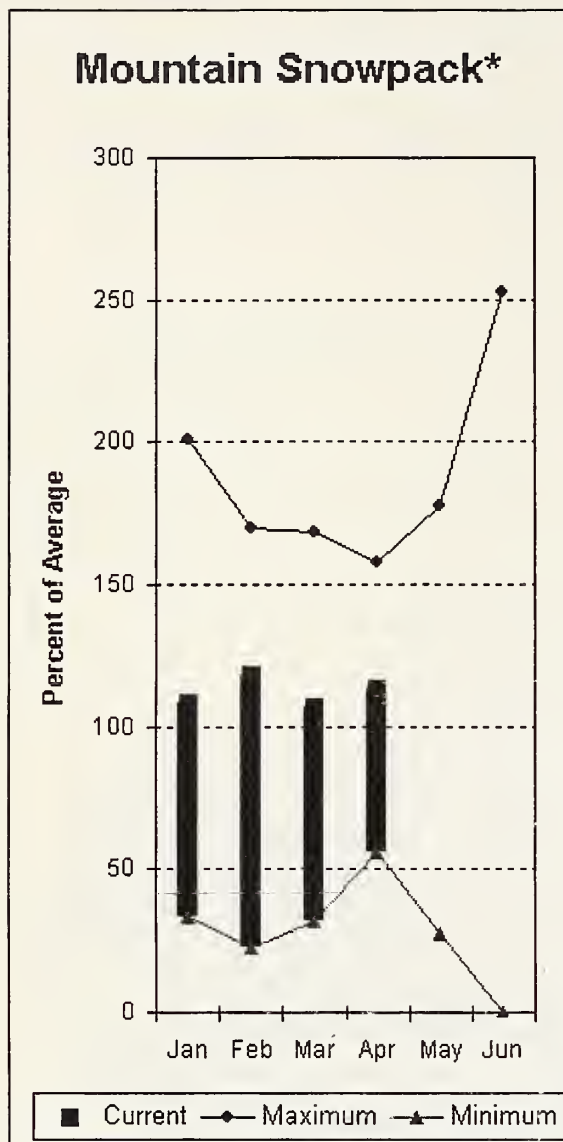
Walla Walla River Basin  
Percent of Average  
April 1, 2002

Snowpack - 126%  
Precipitation - 102%



High Ridge ■

## Lower Snake River Basin



\*Based on selected stations

The April - September forecast is for 112% for Clearwater River at Spalding. The Grande Ronde River can expect summer flows to be about 100% of normal and the Snake River below Lower Granite Dam is forecasted to have only 88% of normal flows. March precipitation was 134% of average, bringing the year-to-date precipitation to 112% of average. April 1 snowpack readings averaged 113% of normal. March streamflow was 59% of average for Snake River below Lower Granite Dam and 67% for Grande Ronde River near Troy. Average temperatures were 3 degrees below normal for March and near average for the water year.

*For more information contact your local Natural Resources Conservation Service office.*



# Lower Snake River Basin

## Streamflow Forecasts - April 1, 2002

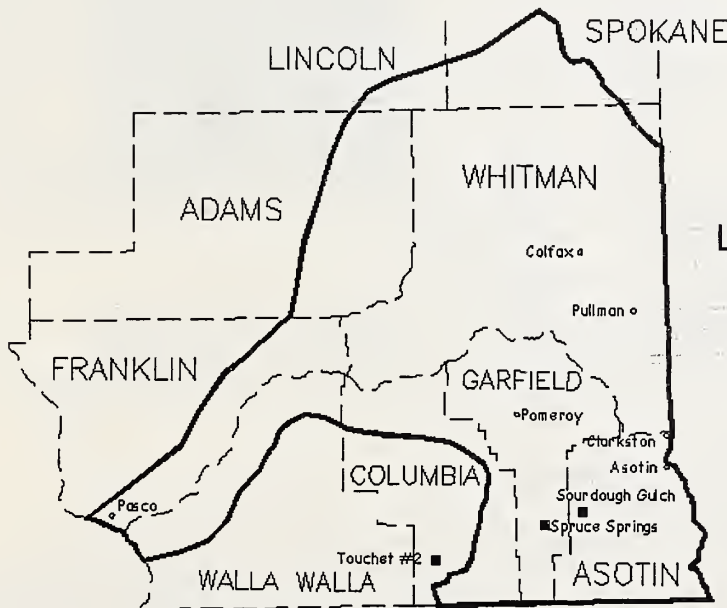
Forecast Point	Forecast Period	<<----- Drier ----- Future Conditions ----- Wetter ----->>						30-Yr Avg. (1000AF)
		90% (1000AF)	70% (1000AF)	Chance Of Exceeding *		30% (1000AF)	10% (1000AF)	
GRANDE RONDE at Troy (1)	APR-JUL	874	1108	1215	100	1322	1556	1214
	APR-SEP	1002	1255	1370	100	1485	1738	1372
CLEARWATER at Spalding (1,2)	APR-JUL	6991	7953	8390	113	8827	9789	7435
	APR-SEP	7355	8362	8820	112	9278	10285	7850
SNAKE blw Lower Granite Dam (1,2)	APR-JUL	14284	17665	19200	89	20735	24116	21550
	APR-SEP	15775	19574	21300	88	23026	26825	24100

LOWER SNAKE RIVER BASIN Reservoir Storage (1000 AF) - End of March					LOWER SNAKE RIVER BASIN Watershed Snowpack Analysis - April 1, 2002			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
					LOWER SNAKE, GRANDE RONDE	17	188	113

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1971-2000 base period.

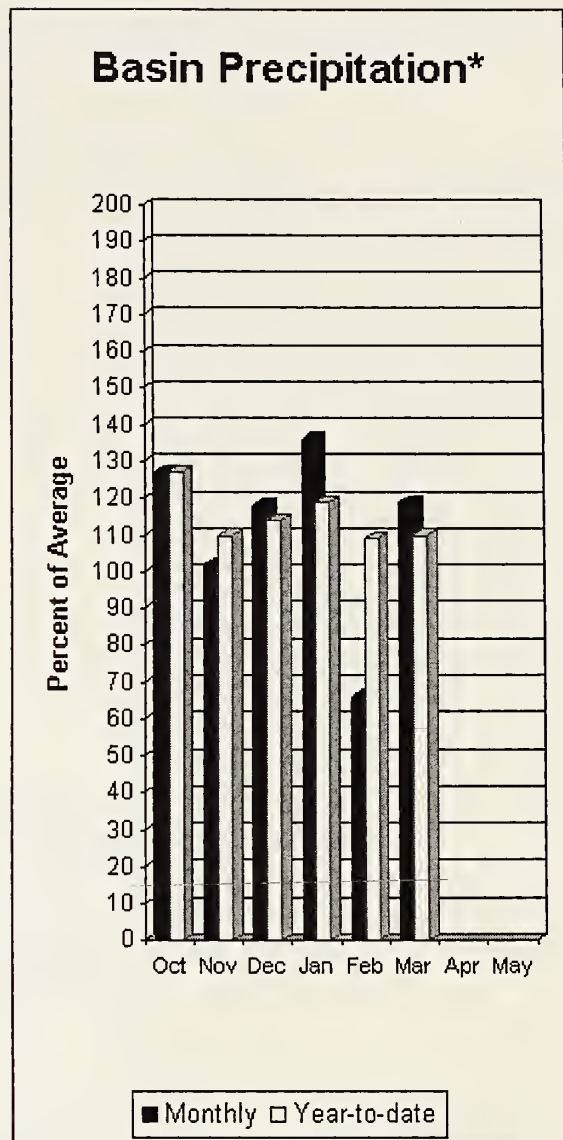
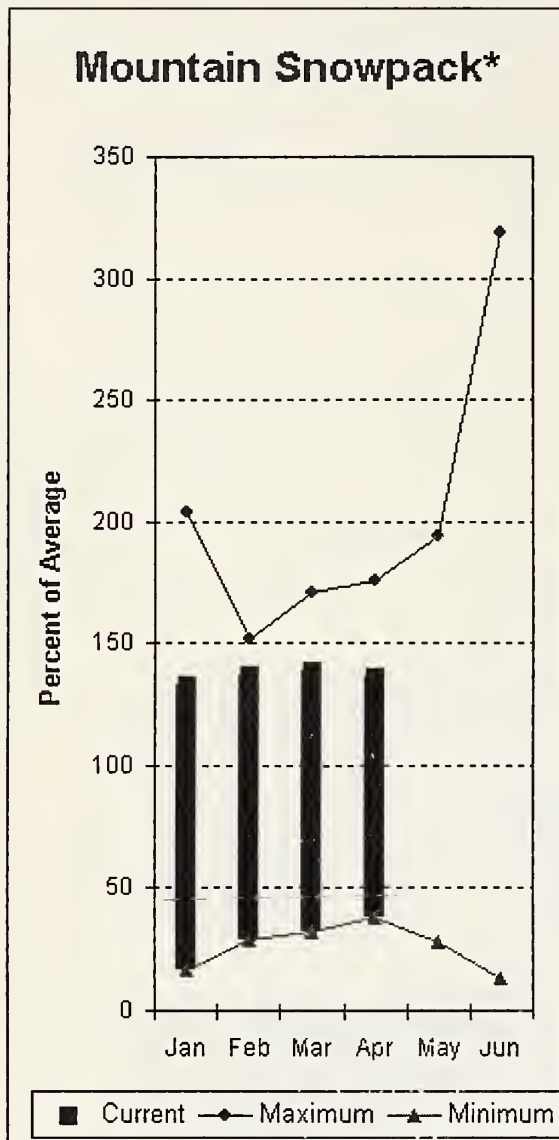
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Lower Snake River Basin  
Percent of Average  
April 1, 2002

Snowpack - 113%  
Precipitation - 112%

## Cowlitz - Lewis River Basins



\*Based on selected stations

Forecasts for April – September streamflows within the basin are Lewis River at Ariel, 116% and Cowlitz River at Castle Rock, 101% of average. The Columbia River at The Dalles is forecasted to have 94% of average flows this summer. March average streamflow for Cowlitz River was 89% and 92% for Lewis River. The Columbia River at The Dalles was also down at 65% of average. March precipitation was 119% of average and the water-year average was 110%. April 1 snow cover for Cowlitz River was 109% and Lewis River was 162% of average. Paradise Park SNOTEL reported the most water content for the basin with 84.5 inches. Average April 1 water content is 71.9 inches. Average temperatures were 3 degree below normal during March and have averaged 1 degree above throughout the water year.

For more information contact your local Natural Resources Conservation Service office.

# Cowlitz - Lewis River Basins

## Streamflow Forecasts - April 1, 2002

		<<----- Drier ----->>		Future Conditions		----- Wetter ----->>		
Forecast Point	Forecast Period	Chance Of Exceeding *						30-Yr Avg. (1000AF)
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	
LEWIS at Ariel (2)	APR-JUL	908	1073	1185	115	1297	1462	1031
	APR-SEP	1076	1245	1360	116	1475	1644	1176
COWLITZ R. b1 Mayfield Dam (2)	APR-SEP	1188	1707	2060	107	2413	2932	1922
	APR-JUL	936	1456	1810	107	2164	2684	1692
COWLITZ R. at Castle Rock (2)	APR-SEP	1462	2181	2670	101	3159	3878	2639
	APR-JUL	1483	1981	2320	102	2659	3157	2279
KLICKITAT near Glenwood	APR-JUN	127	136	142	110	148	157	129
	APR-SEP	157	170	179	110	188	201	163
COLUMBIA R. at The Dalles (2)	APR-SEP	82294	88549	92800	94	97051	103306	98650
	APR-JUL	68963	75654	80200	95	84746	91437	84650

COWLITZ - LEWIS RIVER BASINS Reservoir Storage (1000 AF) - End of March					COWLITZ - LEWIS RIVER BASINS Watershed Snowpack Analysis - April 1, 2002			
Reservoir	Usable Capacity	*** This Year	Usable Last Year	Storage Avg	Watershed	Number of Data Sites	This Year as % of Last Yr Average	
					LEWIS RIVER	4	247	162
					COWLITZ RIVER	7	206	109

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

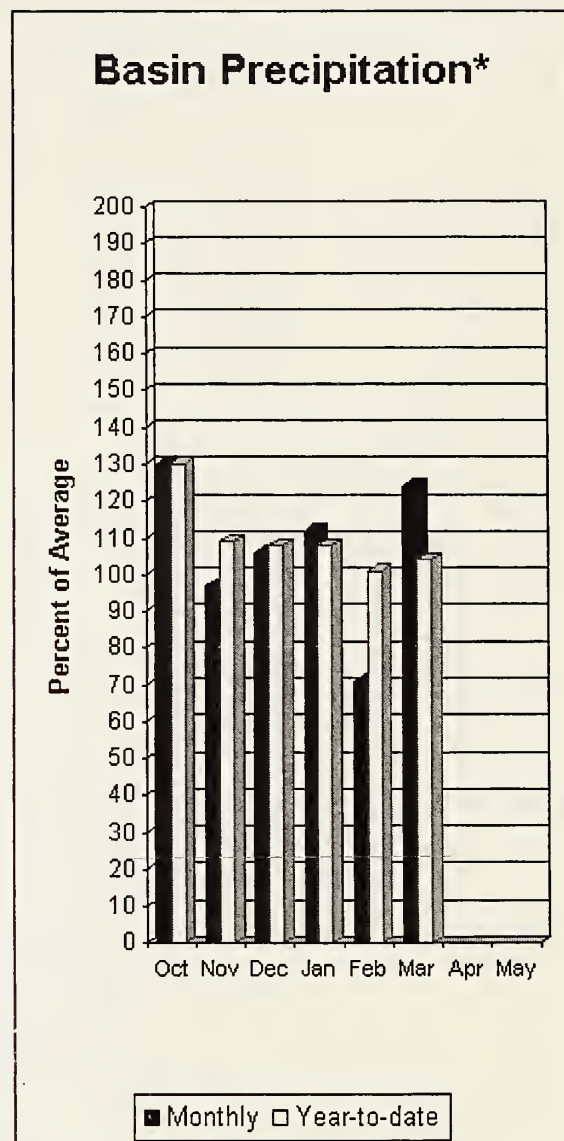
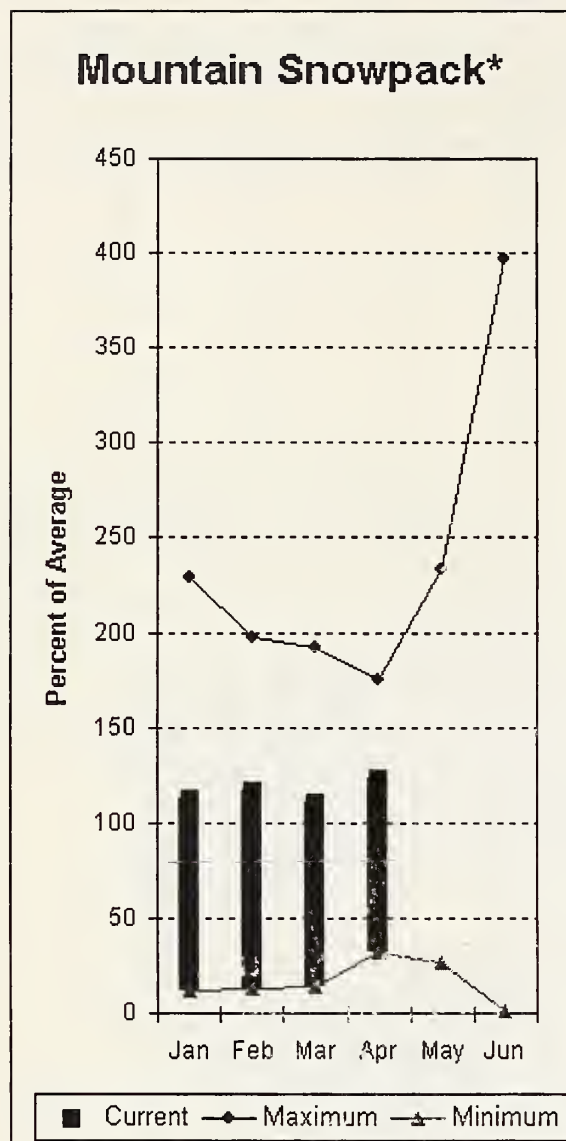
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## White - Green River Basins



\*Based on selected stations

Summer runoff is forecast to be 115% of normal for the Green River below Howard Hanson Dam and 109% for the White River near Buckley. April 1 snowpack was 108% of average in both White River and Puyallup river basins and 154% in Green River Basin. Water content on April 1 at Corral Pass SNOTEL, at an elevation of 6,000 feet, was 42.1 inches. This site has an April 1 average of 34.9 inches. March precipitation was 124% of average, bringing the water year-to-date to 104% of average for the basins. Average temperatures in the area were 3-4 degrees above normal last month and remain near average for the water-year.

*For more information contact your local Natural Resources Conservation Service office.*

# White - Green - Puyallup River Basins

## Streamflow Forecasts - April 1, 2002

		<<===== Drier =====>>		Future Conditions		===== Wetter =====>>		
Forecast Point	Forecast Period	=====		Chance Of Exceeding *		=====		30-Yr Avg. (1000AF)
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF) (% AVG.)	30% (1000AF)	10% (1000AF)		
WHITE near Buckley (1,2)	APR-JUL	404	456	480	109	504	556	440
	APR-SEP	494	555	582	109	609	670	534
GREEN below Howard Hanson (1,2)	APR-JUL	231	264	279	115	294	327	243
	APR-SEP	255	292	308	115	324	361	268

### WHITE - GREEN - PUYALLUP RIVER BASINS Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage ***		
		This Year	Last Year	Avg

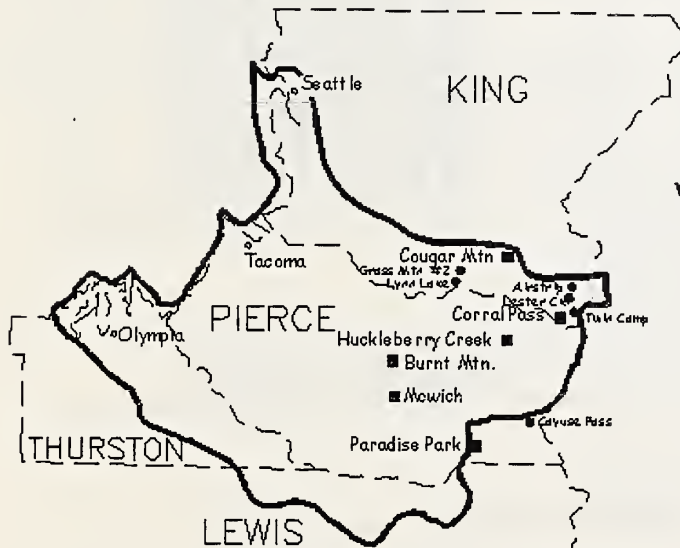
### WHITE - GREEN - PUYALLUP RIVER BASINS Watershed Snowpack Analysis - April 1, 2002

Watershed	Number of Data Sites	This Year as % of	
		Last Yr	Average
WHITE RIVER	3	214	108
GREEN RIVER	7	255	154
PUYALLUP RIVER	3	218	108

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1971-2000 base period.

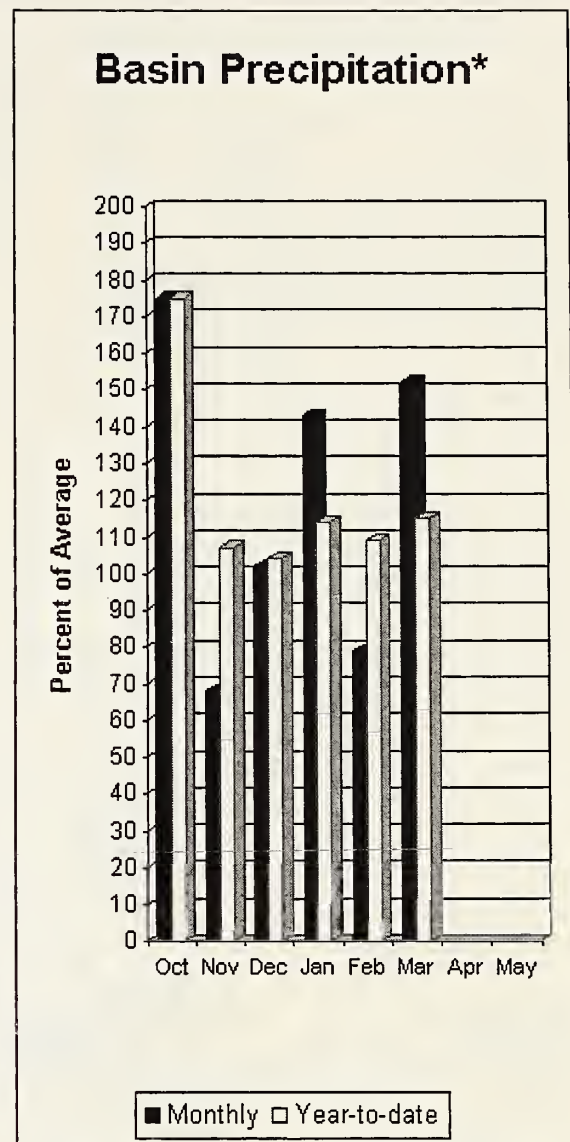
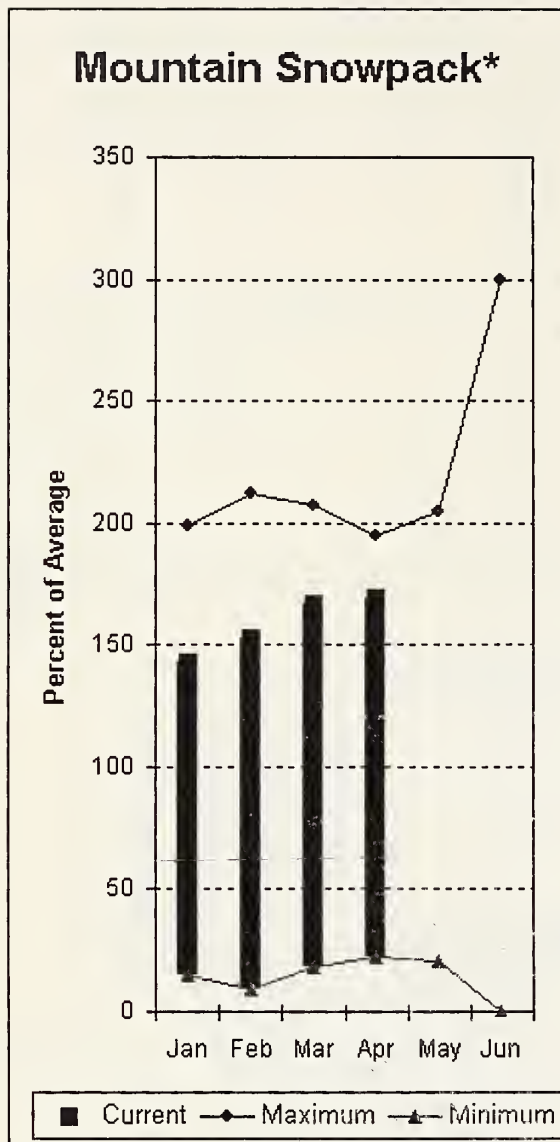
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 (2) - The value is natural flow - actual flow may be affected by upstream water management.



White-Green-Puyallup Basins  
Percent of Average  
April 1, 2002

Snowpack - 123%  
Precipitation - 104%

## Central Puget Sound River Basins



\*Based on selected stations

Forecast for spring and summer flows are: 150% for Cedar River near Cedar Falls; 155% for Rex River; 117% for South Fork of the Tolt River; and 141% for Cedar River at Cedar Falls. Basin-wide precipitation for March was 152% of average, bringing water-year-to-date to 115% of average. April 1 average snow cover in Cedar River Basin was 169%, Tolt River Basin was 195%, Snoqualmie River Basin was 159%, and Skykomish River Basin was 151%. Olallie Meadows SNOTEL site at 3,960 feet, had 65.6 inches of water content. Average April 1 water content is 55.9 inches at Olallie Meadows. March temperatures were 4 degrees above average for the past month but near normal for the water-year.



# Central Puget Sound River Basins

## Streamflow Forecasts - April 1, 2002

		<<===== Drier =====		Future Conditions		===== Wetter =====>>		
Forecast Point	Forecast Period	Chance Of Exceeding *						30-Yr Avg. (1000AF)
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	
CEDAR near Cedar Falls	APR-JUL	96	104	110	151	116	124	73
	APR-SEP	105	114	120	150	126	136	80
REX near Cedar Falls	APR-JUL	32	36	39	156	42	46	25
	APR-SEP	36	41	44	155	47	51	28
CEDAR RIVER at Cedar Falls	APR-JUL	83	95	104	141	113	125	74
	APR-SEP	84	95	103	141	111	122	73
SOUTH FORK TOLT near Index	APR-JUL	14.5	15.9	16.9	115	17.9	19.3	14.7
	APR-SEP	16.6	18.5	19.7	117	21	23	16.9

CENTRAL PUGET SOUND RIVER BASINS Reservoir Storage (1000 AF) - End of March					CENTRAL PUGET SOUND RIVER BASINS Watershed Snowpack Analysis - April 1, 2002			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
					CEDAR RIVER	5	237	169
					TOLT RIVER	3	297	195
					SNOQUALMIE RIVER	6	240	159
					SKYKOMISH RIVER	4	237	151

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1971-2000 base period.

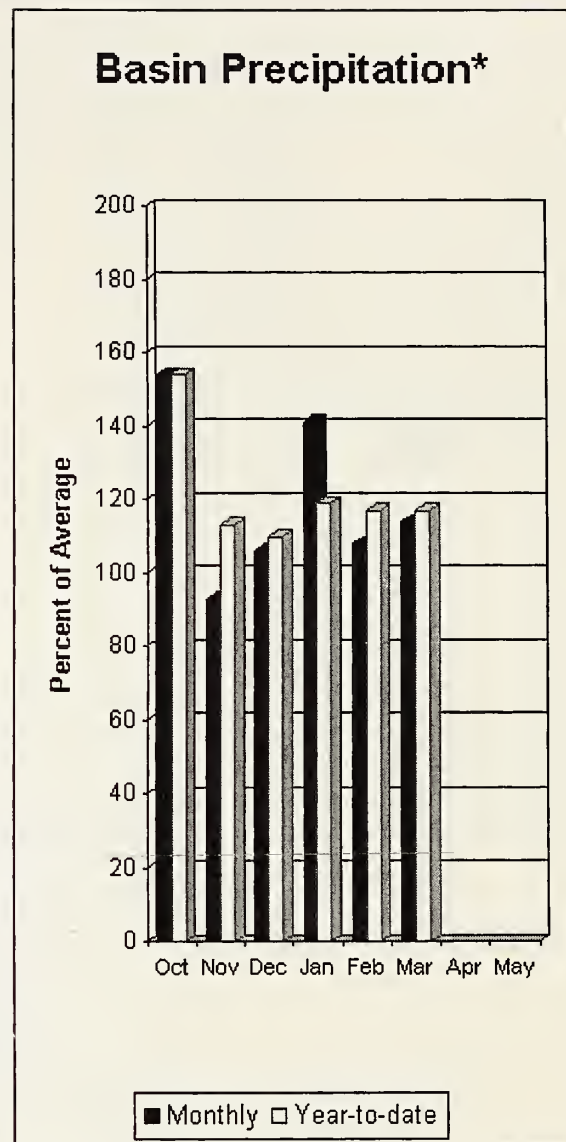
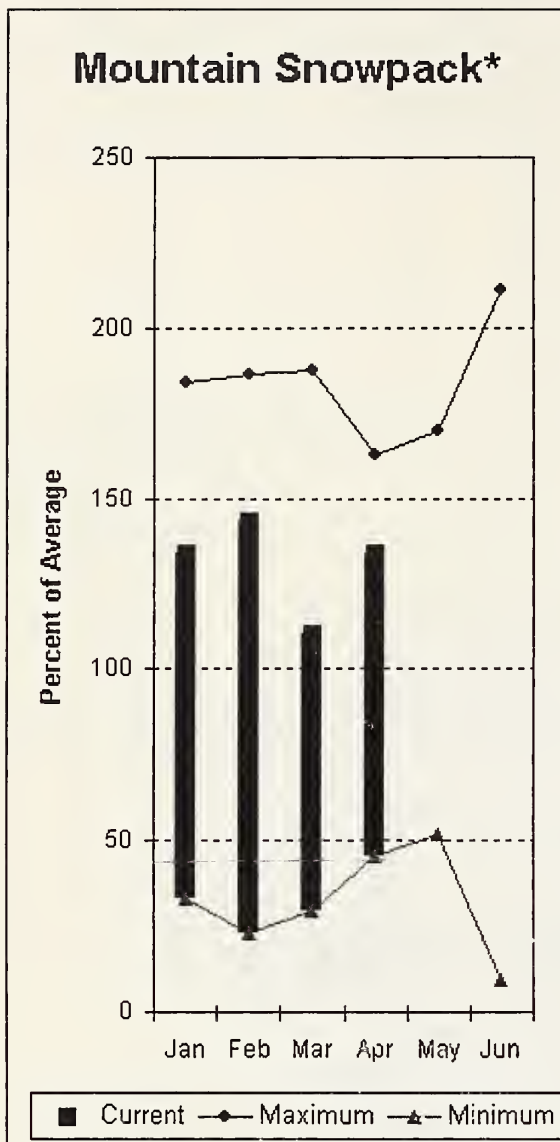
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 (2) - The value is natural flow - actual flow may be affected by upstream water management.

Central Puget Sound Basins  
Percent of Average  
April 1, 2002

Snowpack - 169%  
Precipitation - 115%



## North Puget Sound River Basins



\*Based on selected stations

Forecast for Skagit River streamflow at Newhalem is 107% of average for the spring and summer period. March streamflow in Skagit River was 86% of average. Other forecast points included Baker River and Thunder Creek at 104% of average. Basin-wide precipitation for March was 114% of average, bringing water-year-to-date to 117% of average. April 1 average snow cover in Skagit River Basin was 127%, Baker River Basin was 134%, and Nooksack River Basin was 140%. Rainy Pass SNOTEL, at 4,780 feet, had 49 inches of water content. Average April 1 water content is 44 inches at Rainy Pass. April 1 Skagit River reservoir storage was 86% of average and 45% of capacity. Average March temperatures were 4-5 degrees below normal for the basin and near average for the water year.

*For more information contact your local Natural Resources Conservation Service office.*

# North Puget Sound River Basins

## Streamflow Forecasts - April 1, 2002

Forecast Point	Forecast Period	<<----- Drier ----- Future Conditions ----- Wetter ----->>						30-Yr Avg. (1000AF)
		Chance Of Exceeding *						
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	
THUNDER CREEK near Newhalem	APR-JUL	220	236	247	106	258	274	234
	APR-SEP	316	333	345	104	357	374	333
SKAGIT at Newhalem (2)	APR-JUL	1814	1919	1990	107	2061	2166	1864
	APR-SEP	2172	2297	2382	107	2467	2592	2217
BAKER RIVER near Concrete	APR-JUL	760	819	860	104	901	960	828
	APR-SEP	967	1040	1090	104	1140	1213	1050

NORTH PUGET SOUND RIVER BASINS Reservoir Storage (1000 AF) - End of March					NORTH PUGET SOUND RIVER BASINS Watershed Snowpack Analysis - April 1, 2002			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
ROSS	1404.1	584.5	724.9	693.0	SKAGIT RIVER	12	259	127
DIABLO RESERVOIR	90.6	86.0	86.7	86.2	BAKER RIVER	2	266	134
GORGE RESERVOIR	9.8	6.9	7.8	8.0	NOOKSACK RIVER	1	234	140

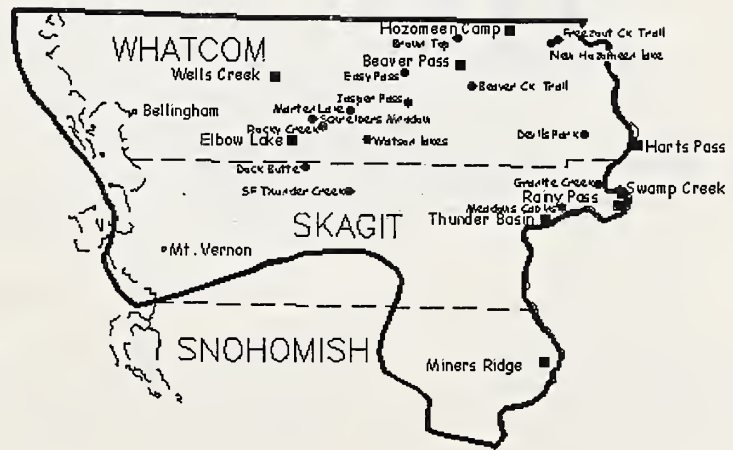
\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1971-2000 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.  
 (2) - The value is natural flow - actual flow may be affected by upstream water management.

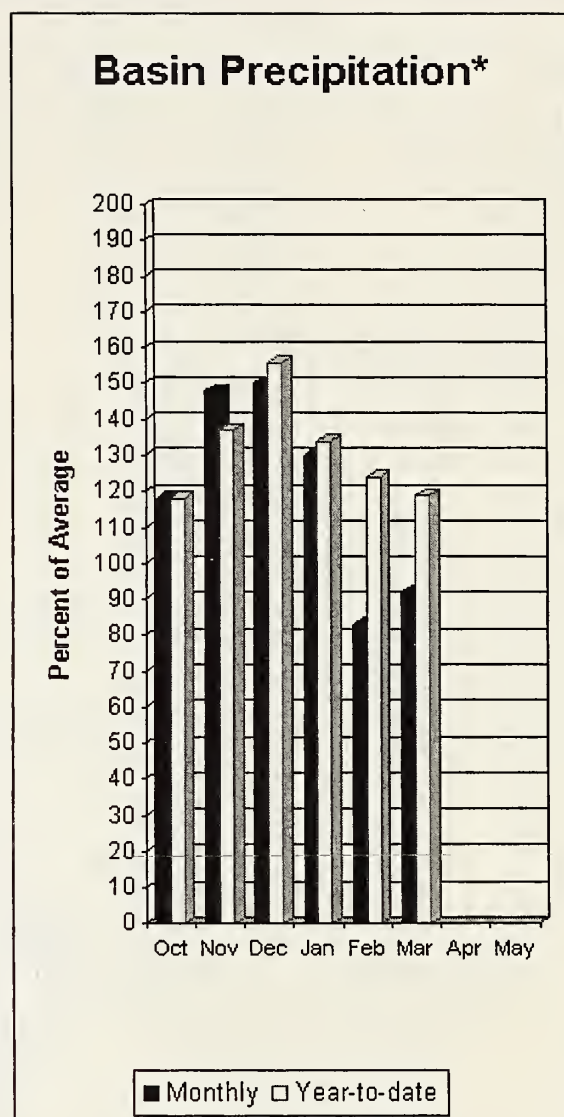
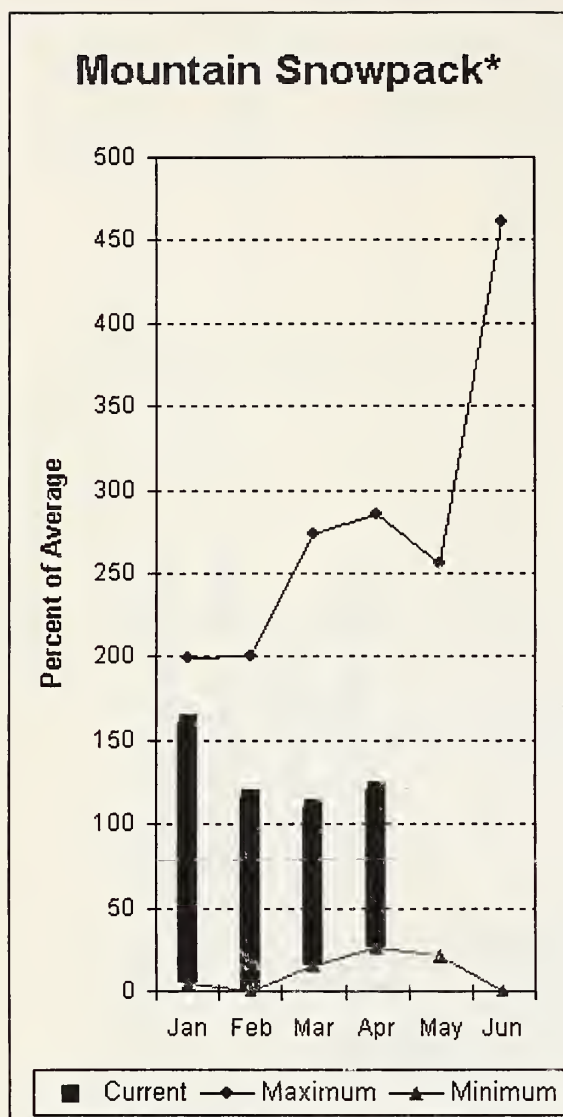
North Puget Sound Basins  
Percent of Average  
April 1, 2002

Snowpack - 134%  
Precipitation - 117%  
Reservoir Capacity - 45%





## Olympic Peninsula River Basins



\*Based on selected stations

Forecasted average runoff for streamflow in the Dungeness River is 106% and Elwha River is 104%. Big Quilcene and Wynoochee rivers should expect near average runoff this summer also. March precipitation was 92% of average. Precipitation has accumulated at 119% of average for the water year. March precipitation at Quillayute WSO was 9.51 inches. The thirty-year average for March is 10.98 inches. Olympic Peninsula snowpack averaged 120% of normal on April 1. Temperatures were 3-4 degrees below average for the month and near average for the water year.

For more information contact your local Natural Resources Conservation Service office.

# Olympic Peninsula River Basins

## Streamflow Forecasts - April 1, 2002

		<<===== Drier ===== Future Conditions ===== Wetter =====>>						
Forecast Point	Forecast Period	90% 70%		Chance Of Exceeding *		30% 10%		30-Yr Avg.
		(1000AF)	(1000AF)	(1000AF)	(% AVG.)	(1000AF)	(1000AF)	
DUNGENESS near Sequim	APR-SEP	143	154	161	106	168	179	152
	APR-JUL	117	126	132	107	138	147	124
ELWHA near Port Angeles	APR-SEP	464	500	525	104	550	586	503
	APR-JUL	384	416	437	104	458	490	419

OLYMPIC PENINSULA RIVER BASINS Reservoir Storage (1000 AF) - End of March					OLYMPIC PENINSULA RIVER BASINS Watershed Snowpack Analysis - April 1, 2002			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
					OLYMPIC PENINSULA	4	263	120
					ELWHA RIVER	1	493	116
					MORSE CREEK	1	274	125
					DUNGENESS RIVER	1	304	120
					QUILCENE RIVER	1	180	118
					WYNOOCHEE RIVER	0	0	0

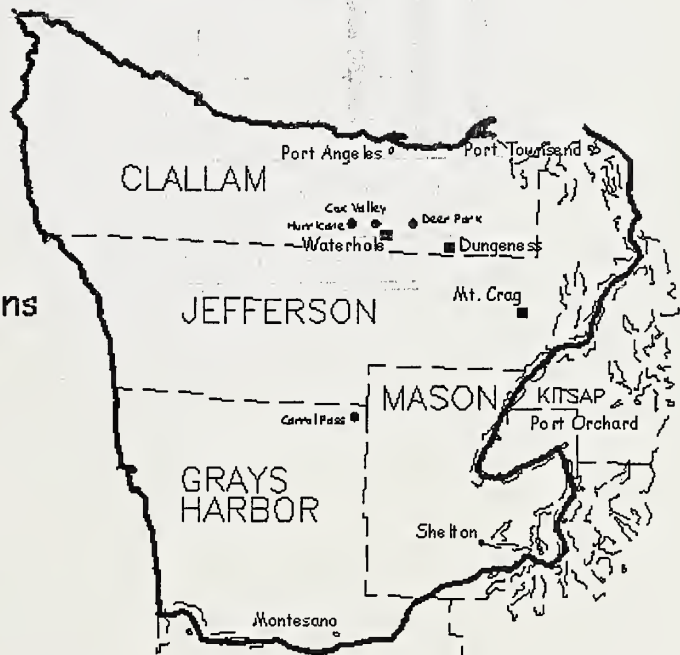
\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1971-2000 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.  
 (2) - The value is natural flow - actual flow may be affected by upstream water management.

Olympic Peninsula River Basins  
Percent of Average  
April 1, 2002

Snowpack - 120%  
Precipitation - 119%







*Issued by*

**Bruce Knight**  
**Chief**  
**Natural Resources Conservation Service**  
**U.S. Department of Agriculture**

*Released by*

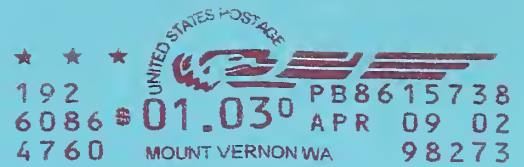
**R.L. "Gus" Hugbanks**  
**State Conservationist**  
**Natural Resources Conservation Service**  
**Spokane, Washington**

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## The Following Organizations Cooperate with the Natural Resources Conservation Service in Snow Survey Work\*:

<b>Canada</b>	Ministry of Sustainable Resources Snow Survey, River Forecast Centre, Victoria, British Columbia
<b>State</b>	Washington State Department of Ecology Washington State Department of Natural Resources
<b>Federal</b>	Department of the Army Corps of Engineers U.S. Department of Agriculture Forest Service U.S. Department of Commerce NOAA, National Weather Service U.S. Department of Interior Bonneville Power Administration Bureau of Reclamation Geological Survey National Park Service Bureau of Indian Affairs
<b>Local</b>	City of Tacoma City of Seattle Chelan County P.U.D. Pacific Power and Light Company Puget Sound Power and Light Company Washington Water Power Company Snohomish County P.U.D. Colville Confederated Tribes Spokane County Yakama Indian Nation Whatcom County Pierce County
<b>Private</b>	Okanogan Irrigation District Wenatchee Heights Irrigation District Newman Lake Homeowners Association Whitestone Reclamation District

\*Other organizations and individuals furnish valuable information for the snow survey reports. Their cooperation is gratefully acknowledged.



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# Washington Water Supply Outlook Report

Natural Resources Conservation Service  
Spokane, WA







